

NASA CR-62041

April 20, 1967

communiqué

Wallops, Suite 140, 2000 P Street, N.W., Washington, D.C. 20546-0140

FACILITY FORM 602	N67-25642	
	(ACCESSION NUMBER)	(THRU)
	73 (PAGES)	1 (CODE)
	CR-62041 (NASA CR OR TMX OR AD NUMBER)	04 (CATEGORY)

SCIENTIFIC PUBLICATIONS  
OF THE  
BIOSCIENCE PROGRAMS DIVISION  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
VOLUME II. ENVIRONMENTAL BIOLOGY

SCIENTIFIC PUBLICATIONS OF THE  
BIOSCIENCE PROGRAM DIVISION

VOLUME II ENVIRONMENTAL BIOLOGY

by

Frances Hong and L. A. Kulp

of the

Biological Sciences Communication Project

C. W. Shilling, M.D., Director

sponsored by

The George Washington University

April 20, 1967

work performed under NASA Contract

NSR 09 010 027

## TABLE OF CONTENTS

	<u>Page</u>
PREFACE . . . . .	i
LIST OF CITATIONS . . . . .	1
AUTHOR INDEX . . . . .	27
PERMUTED TITLE INDEX . . . . .	31
SENIOR AUTHORS AND ABBREVIATED LABORATORY ADDRESSES . . . . .	56
LABORATORY ADDRESSES . . . . .	59
ANALYSIS OF THE PUBLICATION SOURCES . . . . .	62

## PREFACE

This bibliography was prepared to supplement the needs of various bioscience administrators at the National Aeronautics and Space Administration for maintaining a current awareness in their respective fields. When critically analyzed, bibliographies provide meaningful insight to the state of activities for scientific endeavors by defining areas of pursuit, providing records of accomplishment, identifying scientists and laboratories engaged in various scientific activities, revealing the direction of research and the areas of gradient emphasis in addition to listing the available literature in a particular subject field. For these reasons the importance of bibliographies is being increasingly recognized by both science administrators and research scientists.

The more than 1,400 citations in the total work represent the publication efforts of the grantees and contractors of the Bioscience Program Division since it was established. Letters were sent to the principal investigators requesting a list of publications resulting from research supported by grants or contracts from this division. The citations included in this bibliography were provided in response to this letter. Only those papers appearing in the serial literature and widely distributed report literature were considered. Theses and doctoral dissertations were omitted since such research would probably be published in scientific journals at a later date.

These citations have been collated into separate volumes for each program branch. A few citations predate the establishment of the branch offices under which they appear but are included because they resulted from efforts subsequently subsumed under these program offices. The volumes are enumerated as follows: Volume I, Behavioral Biology; Volume II, Environmental Biology; Volume III, Exobiology; Volume IV, Physical Biology; Volume V and VI, Planetary Quarantine and Bioscience Communications, respectively. Because of the brevity of the latter two bibliographies, they have been combined under one cover.

Each volume is divided into a number of sections beginning with the literature citations listed chronologically and according to the authors' surname. This arrangement reveals to some extent the growth and development of research under the direction of the program administrators. To provide access to these references both an author index and permuted title index are included.

An appendix is included which lists the journals in which these scientific publications appeared. This not only assists in identifying source material but indicates the wide range of scientific pursuit encompassed by the Bioscience Programs Division. It is interesting to note here that the publications have appeared in 268 scientific and technical journals.

Also in the appendix is a list of senior authors' affiliations which, when correlated with the directory of laboratory addresses, makes communication with a senior author possible. Copies or reprints of the citations embodied herein cannot be furnished by either NASA or BSCP but may be obtained by contacting the senior authors.

It should be noted that no practical means was available for verifying a few of the references given by the authors and, as a result, some citations are incomplete. This is especially true in cases where papers appeared in lesser known sources and/or were "in press".

The authors gratefully acknowledge the technical assistance of Miss Sheila Rollins and of the secretarial staff in the preparation of this report.

Leslie A. Kulp, Ph.D.

SCIENTIFIC PUBLICATIONS OF THE ENVIRONMENTAL BIOLOGY PROGRAM,  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

1960

429. HIXSON, W. C., PALUDAN, C. T., and DOWNS, S. W. JR. Primate bio-instrumentation for two Jupiter ballistic flights. IRE Trans. Med. Electron. ME-7:318-325. Oct. 1960.

1961

430. BONGERS, L. Radiation tolerances in photosynthesis and consequences of excess. In P. A. Campbell, ed. Medical and Biological Aspects of the Energies of Space, p. 299-322. New York, Columbia University Press. 1961.
431. FREDRICKSON, A. G., BROWN, A. H., MILLER, R. L., and TSUCHIYA, H. M. Optimum conditions for photosynthesis in optimally dense cultures of algae. ARS J. 31:1429-1435. 1961.
432. MAQSOOD, M., and ASHIKAWA, J. K. Fertility studies of X-irradiated male mice. Fertil. Steril. 12:452-458. 1961.
433. TOBIAS, C. A., and WALLACE, R. Particulate radiation: electrons and protons. In Medical and Biological Aspects of the Energies of Space, p. 421-442. New York, Columbia University Press. 1961.

1962

434. BEISCHER, D. E. Survival of animals in magnetic fields of 120,000 gauss. U. S. Naval Med. Res. Inst., Bureau of Medicine and Surgery, Pensacola, Fla., MR005.13-9010 Subtask 1, Report No. 6. 1962. (NASA Order R-39)
435. BEISCHER, D. E., and MILLER, E. F. Exposure of man to low intensity magnetic fields. U. S. Naval Med. Res. Inst., Bureau of Medicine and Surgery, Pensacola, Fla., MR005.13-9010 Subtask 1, Report No. 5. 1962. (NASA Order R-39)
436. CLOSE, P., and BEISCHER, D. E. Experiments with Drosophila melanogaster in magnetic fields. U. S. Naval Med. Res. Inst., Bureau of Medicine and Surgery, Pensacola, Fla., MR005.13-9010 Subtask 1, Report No. 7. 1962. (NASA Order R-39)
437. CODY, R. M., and TISCHER, R. G. Microbial synthesis of animal feeds from human waste substrates. Develop. Ind. Microbiol. 3:53-62. 1962.

438. GAINNEY, M. D., BERGER, W. C., and TAGAMI, Y. A recording system for measuring bioelectric transients. Berkeley, Calif., University of California, Donner Lab. and Donner Pavilion, UCRL 10452. Sept. 4, 1962.
439. HANSEN, J. T., and PACE, N. Apparatus for automatic dye dilution measurement of cardiac output. J. Appl. Physiol. 17:163-166. 1962.
440. JENKINS, T., and WALLACE, R. Argon-helium scintillation. Berkeley, California, University of California, Donner Lab. and Donner Pavilion, UCRL 10523. Oct. 24, 1962.
441. MAQSOOD, M., and ASHIKAWA, J. K. Post-irradiation protection and recovery. I. Effects of lipids on haematopoietic organs of X-irradiated male mice. Int. J. Radiat. Biol. 4:521-531. 1962.
442. MEEK, J. C., GRAYBIEL, A., BEISCHER, D. E., and RIOPELLE, A. J. Observations of canal sickness and adaptation in chimpanzees and squirrel monkeys in a slow rotation room. Aerosp. Med. 33:571-578. 1962.
443. MOYER, B. J., and WALLACE, R. Shielding and activation considerations for a meson factory. Berkeley, California, University of California, Donner Lab. and Donner Pavilion, UCRL 10086. Apr. 11, 1962.
444. SALISBURY, F. B. Martian biology. Science 136:17-26. 1962.
445. SOROKIN, C. Carbon dioxide and bicarbonate in cell division. Arch. Microbiol. 44:219-227. 1962.
446. SOROKIN, C. Effects of acidity on cell division. Exp. Cell Res. 27: 583-584. 1962.
447. TOBIAS, C. A., and SLATER, J. V. Our view of space biology widens. Astronautics 7:20-22, 47-52. 1962.
448. TODD, P. W. Proton activation in space vehicles. Berkeley, California, University of California, Donner Lab. and Donner Pavilion, UCRL 10683, p. 1-14. Fall 1962.
449. WALLACE, R. The physics of space radiation. Adv. Biol. Med. Phys. 8: 343. 1962.
450. WALLACE, R., and SONDHaus, C. Techniques used in shielding calculations for high-energy accelerators: applications to space shielding. Berkeley, California, University of California, Donner Lab. and Pavilion, UCRL 10439. Oct. 11, 1962.

1963

451. ACETO, H. JR., and CHURCHILL, B. W. Neutron depth dose from ( $\alpha$ , h) and ( $\gamma$ , h) sources in a tissue-equivalent. Berkeley, California, University of California, Donner Lab. and Donner Pavilion, UCRL 10267. Mar. 4, 1963.

452. ADAMS, L. R., and SONDHaus, C. A. A cytophotometric method for study of the erythroid development sequence in mammals. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11033, p. 118-125. Sept. 1963.
453. AMER, N. M. Modification of radiation effects with magnetic fields. Radiat. Res. 19:215. 1963.
454. ASHIKAWA, J. K., SONDHaus, C. A., TOBIAS, C. A., GREENFIELD, C., and HOWARD, J. Studies on the mammalian radiation syndrome with high-energy particulate radiation. I. Difference in injury mode and its dose-rate dependence for 100-kVp X rays and 730-MeV protons. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11033, p. 12-18. Sept. 1963.
455. BAUER, W. G., FREDRICKSON, A. G., and TSUCHIYA, H. M. Mass transfer characteristics of a Venturi liquid-gas contactor. I & EC Process Design and Develop. 2:78-187. 1963.
456. BEISCHER, D. E. Biological effects of magnetic fields in space travel. In 12th International Astronautical Congress, p. 515-525. New York, Academic Press, Inc., 1963.
457. BEISCHER, D. E. Biomagnetics. In Lectures in Aerospace Medicine, p. 365-386. Brooks AFB, Texas, Feb. 1963.
458. BEISCHER, D. E. Neurological responses to external electromagnetic energy. In A Critique of Currently Available Data and Hypotheses at the Brain Research Institute, UCLA. Co-Sponsored by the Brain Research Institute, UCLA and the Air Force Systems Command, USAF, p. 70-71. 1963.
459. BIENERT, H., and KOK, B. Relationship between light induced EPR signal and pigment P700. In Photosynthesis Mechanisms in Green Plants, p. 131-137. Washington, D. C., Nat. Acad. Sci. - Nat. Res. Council, 1963. (Publ. 1145)
460. BONGERS, L. Question of sustaining man in space. In D. Carrick, ed. Research Reviews, p. 38. 1963/1964.
461. BURTON, R. R., RICHARDS, W. F. C., and SMITH, A. H. Pathology of chronic acceleration. Aerosp. Med. 34:249. 1963.
462. CAHILL, C. L., JORDAN, J. P., ALLRED, J. B., and CLARK, R. T. Lipid and protein metabolism in rats in oxygen under simulated high altitude conditions. Physiologist 6:151. 1963.
463. CODY, R. M., and TISCHER, R. G. Quantitative measurement of urinary nitrogen and total solids depletion in a closed ecological system during microbial synthesis. Develop. Ind. Microbiol. 4:261-267. 1963.
464. FREDRICKSON, A. G., and TSUCHIYA, H. M. Continuous propagation of microorganisms. AIChE J. 9:459-468. 1963.



465. FURRY, D. E., LOWERY, R. T., and BEISCHER, D. E. Laboratory maintenance of the squirrel monkey. Lab. Primate Newsletter 2:1-2. July 1963.
466. GALLOWAY, R. A., and KRAUSS, R. W. Utilization of phosphorous sources by *Chlorella*. In Japanese Society of Plant Physiologists, eds. Studies on Microalgae and Photosynthetic Bacteria, p. 569-576. Tokyo, University of Tokyo Press, 1963.
467. GORDON, S. A. Gravity and plant development: bases for experiment. In F. A. Gilfillan, ed. Space Biology. Proceedings of the 24th Biology Colloquium, p. 75-105. Corvallis, Oregon, Oregon State University Press, 1963.
468. HANSEN, J. T., and PACE, N. Evaluation of cardiovascular physiology in animals during space flight. Proc. San Diego Symp. Biomed. Eng. p. 209-213. 1963.
469. HANSEN, J. T., PACE, N., and RAHLMANN, D. F. Physiological monitoring of animals during space flight. Biomed. Sci. Instrum. 1:299-307. 1963.
470. HOCH, G., and OWENS, O. V. H. Photoreactions and respiration. In Photosynthesis Mechanisms in Green Plants, p. 409-420. Washington, D. C., Nat. Acad. Sci. - Nat. Res. Council., 1963. (Publ. 1145)
471. KOK, B. Fluorescence studies. In Photosynthesis Mechanisms in Green Plants, p. 45-55. Washington, D. C., Nat. Acad. Sci. - Nat. Res. Council., 1963. (Publ. 1145)
472. KOK, B. Photosynthetic electron transport. In Photosynthesis Mechanisms in Green Plants, p. 35-44. Washington, D. C., Nat. Acad. Sci. - Nat. Res. Council., 1963. (Publ. 1145)
473. KRAUSS, R. W., and GALLOWAY, R. A. Endogenous metabolism in algae. Ann. N. Y. Acad. Sci. 102:707-716. 1963.
474. LYON, C. J. Auxin transport in leaf epinasty. Plant Physiol. 38(5): 567-574. Sept. 1963. 19 Refs.
475. MANNEY, T. R., BRUSTAD, T., and TOBIAS, C. A. Effects of glycerol and of anoxia on the radio-sensitivity of haploid yeast cells to densely ionizing particles. Radiat. Res. 18:374. 1963.
476. MONTGOMERY, P. O'B., NEUMEYER, B., and ROSENBLUM, E. Ultrastructural changes produced in bacteria by gravity. J. Cell Biol. 19(2): 51A. (Abstr.) Nov. 1963.
477. MONTGOMERY, P. O'B., REYNOLDS, R. C., and KARNEY, D. H. Sub-cellular effects of X-radiation. Lab. Invest. 12(8):858-859. (Abstr.) Aug. 1963.
478. MONTGOMERY, P. O'B., REYNOLDS, R. C., KARNEY, D. H., and HUGHES, B. Nucleolar changes induced by ionizing radiations and carcinogenic agents. Fed. Proc. 22(2, Pt. 1):315. (Abstr.) Mar.-Apr. 1963.

479. MONTGOMERY, P. O'B., VAN ORDEN, F., and ROSENBLUM, E. A relationship between growth and gravity in bacteria. *Aerosp. Med.* 34(4):352-354. Apr. 1963.
480. MUSACCHIA, X. J., JELLINEK, M., and COOPER, T. Effects of X-irradiation during hibernation on tissue catecholamine contents. *Experientia* 19(8):418-419. 1963.
481. MUSACCHIA, X. J., and NEFF, S. S. Active absorption of D-glucose by intestinal segments of the ground-squirrel (Citellus tridecemlineatus). *Comp. Biochem. Physiol.* 9:37-40. 1963.
482. PACE, N., HANSEN, J. T., and BARNSTEIN, N. J. Evaluation of circulatory function at null gravity. *Advances in the Astronautical Sciences* 10:210-219. 1963.
483. POLISSAR, M. J. Convection in low gravitational fields. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11033, p. 83-98. 1963.
484. RESCIGNO, A. Multicompartiment interpretation of radiation - damage curves. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11033, p. 59-64. Sept. 1963.
485. RESCIGNO, A. Operational calculus in two variables. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11033, p. 65-68. Sept. 1963.
486. REYNOLDS, R. C., MONTGOMERY, P. O'B., and KARNEY, D. H. Nucleolar "caps" - a morphologic entity produced by the carcinogen 4-nitroquinoline N-oxide. *Cancer Res.* 23(4):535-538. May 1963.
487. SLATER, J. V., RESCIGNO, A., AMER, N. M., and TOBIAS, C. A. Temperature dependence of wing abnormality in Tribolium confusum. *Science* 140: 408. 1963.
488. SLATER, J. V., TOBIAS, C. A., and AMER, N. M. Modification of radiation response during embryonic development by the use of elevated temperatures. 2nd International Congress of Radiation Research, Harrogate, England, 1962. In *Radiation Effects in Physics, Chemistry and Biology*. Amsterdam, North Holland, 1963.
489. SMITH, A. H., and KELLY, C. F. Influence of chronic acceleration upon growth and body composition. *Ann. N. Y. Acad. Sci.* 110:410-424. 1963.
490. SONDDHAUS, C. A., ASHIKAWA, J. K., TOBIAS, C. A., PASCHKES, V., and LOVE, D. Studies on the mammalian radiation syndrome with high-energy particulate radiation. II. Some factors affecting RBE of 730-MeV protons. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11184, p. 128-135. Fall 1963.
491. SONDDHAUS, C. A., STEWARD, P. G., and WALLACE, R. W. Depth dose in large phantoms irradiation omnidirectionally with high-energy protons. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11033, p. 19-28. Sept. 1963.

492. SOROKIN, C. The capacity for organic synthesis in cells of successive developmental stages. Arch. Mikrobiol. 46:29-43. 1963.
493. SOROKIN, C. Characteristics of the process of aging in algal cells. Science 140(3565):385. (Abstr.) Apr. 26, 1963.
494. SOROKIN, C. Injury and recovery of photosynthesis in cells of successive developmental stages: temperature effects. In Japanese Society of Plant Physiologists, eds. Studies on Microalgae and Photosynthetic Bacteria, p. 99-110. Tokyo, University of Tokyo Press, 1963.
495. SOROKIN, C. On the variability in the activity of the photosynthetic mechanisms. In Photosynthetic Mechanisms in Green Plants, p. 742-750. Nat. Acad. Sci. - Nat. Res. Council., 1963.
496. WALLACE, R., KASE, K., and SONDEHAUS, C. A. Characteristics and intensity profile of a high-energy-proton beam after scattering in a thick target. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11184, p. 136-140. Fall 1963.
497. WEISS, H. S., WRIGHT, R. A., and HIATT, E. P. Incubation and hatching of chicken eggs in an atmosphere almost devoid of nitrogen. Physiologist 6(3):295. 1963.

1964

498. ASHIKAWA, J. K., SONDEHAUS, C. A., TOBIAS, C. A., GREENFIELD, A. G., and PASCHKES, V. Difference in injury mode, dose-rate dependence and RBE of 730-MeV protons, 100 kVp X rays and 250 kVp X rays. In Biological Effects of Neutron and Proton Irradiations, Vol. 1, p. 249-260. Vienna, International Atomic Energy Agency, 1964.
499. BEISCHER, D. E. Biological effects of magnetic fields in their relation to space travel. In K. E. Schaefer, ed. Bioastronautics, p. 173-180. New York, The MacMillan Co., 1964.
500. BEISCHER, D. E. Survival of animals in magnetic fields of 140,000 Oe. In M. F. Barnothy, ed. Biological Effects of Magnetic Fields, p. 201-208. New York, Plenum Press, 1964.
501. BEISCHER, D. E., and FURRY, D. E. Saimiri sciureus as an experimental animal. Anat. Rec. 148:615-624. 1964.
502. BEISCHER, D. E., and KNEPTON, J. C. JR. Influence of strong magnetic fields on the electrocardiogram of squirrel monkeys (Saimiri sciureus). Aerosp. Med. 35:939-944. 1964.
503. BIENERT, H., and KOK, B. An attempt at quantitation of the sharp light-induced electron paramagnetic resonance signal in photosynthetic materials. Biochim. Biophys. Acta 88:278-288. 1964.
504. BONGERS, L. Chemosynthetic gas exchanger. Baltimore, Md., Res. Inst. for Advanced Studies, Report ER 13270-4. July 1964.

505. BONGERS, L. Sustaining life in space - a new approach. *Aerosp. Med.* 35:139-144. 1964.
506. BONGERS, L., and KOK, B. Life support systems for space missions. *Develop. Ind. Microbiol.* 5:183-195. 1964.
507. BROWN, L. R., COOK, D. W., and TISCHER, R. G. Preliminary studies on the extracellular products of Hydrogenomonas eutropha. *Develop. Ind. Microbiol.* 6:223-228. 1964.
508. CODY, R. M., and TISCHER, R. G. Oxidative metabolism of citrate and lactate by Pseudomonas aeruginosa and Serratia indica. *Develop. Ind. Microbiol.* 5:312-315. 1964.
509. COSTELLO, L. C., and SMITH, W. The comparative biochemistry and development of *Ascaris* eggs. V. Changes in catalase activity during embryonation. *Arch. Biochem. Biophys.* 106:223-228. 1964.
510. D'ANGIO, G. J., LAWRENCE, J. H., GOTTSCHALK, A., and LYMAN, J. Relative efficiency of high-LET radiation (Bragg-Peak lithium ions) on normal rabbit skin, using integral dose as a basis for comparison. *Nature* 204:1267-1268. 1964.
511. DINES, J. H., and HIATT, E. P. Prolonged exposure of young rats to an oxygen atmosphere at reduced pressure. *J. Appl. Physiol.* 10(1):17-20. 1964.
512. FOSTER, J. F., and LITCHFIELD, J. H. A continuous culture apparatus for the microbial utilization of hydrogen produced by electrolysis of water in closed-cycle space systems. *Biotechnol. Bioeng.* 6(4):441-456. June 29, 1964.
- \*513. FURRY, D. E. Histopathologic evaluation of a laboratory primate: the squirrel monkey (Saimiri sciureus). U. S. Naval Med. Res. Inst., Bureau of Medicine and Surgery, Pensacola, Fla., MR005. 13-9010 Subtask 5, Report No. 1. 1964. (NASA Order A-34681).
514. GAFFEY, C. T. Bioelectric sensitivity to irradiation of the retina and visual pathways. In T. J. Haley and R. S. Snider, eds. *Response of the Nervous System to Ionizing Radiation*, p. 243-270. Boston, Little, Brown, 1964.
515. GAFFEY, C. T. Blockage of pupillodilation with cyclotron-accelerated alpha particles. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11833, p. 121-133. Fall 1964.
516. HIATT, E. P., WRIGHT, R. A., ALDEN, J., and WEISS, H. S. The effect of short periods of air breathing on oxygen toxicity in mice. *Physiologist* 7(3):159. 1964.
- \*517. HIXSON, W. C., and BEISCHER, D. E. Biotelemetry of the triaxial ballistocardiogram and electrocardiogram in a weightless environment. Naval Aerosp. Med. Inst., Pensacola, Fla., Monograph 10, Sept. 8, 1964. (NASA Order No. R-20)

518. HOCH, G. E. Two light reactions in photosynthesis. Rec. Chem. Progr. 25:165-180. 1964.
519. KRAUSS, R. W. Combined photosynthetic regenerative systems. In Conference on Nutrition in Space and Related Waste Problems, p. 289-297. 1964. (NASA SP-70)
520. MELLOR, R. S., RASCHKE, K., and SALISBURY, F. B. Leaf temperature in controlled environments. Planta (Berlin) 61:56-72. 1964.
521. MILLER, R. L., FREDRICKSON, A. G., BROWN, A. H., and TSUCHIYA, H. M. Hydromechanical method to increase efficiency of algal photosynthesis. I & EC Process of Design and Develop. 3:134-143. 1964.
522. MONTGOMERY, P. O'B., BONNER, W. A., and COOK, J. E. Flying and stepping spot television microscopy. J. Roy. Microscop. Soc. 83(1, 2):73-77. June 1964.
523. MONTGOMERY, P.O'B., and COOK, J. E. Biological and instrumentation designs for living human cell studies in orbiting satellites. Aerosp. Med. 35(3):276. Mar. 1964.
524. MONTGOMERY, P.O'B., KARNEY, D. H., REYNOLDS, R. C., and McCLENDON, D. Cellular and sub-cellular effects of ionizing radiations. Amer. J. Pathol. 44(5):727-746. May 1964.
525. MONTGOMERY, P. O'B., MINTON, P. D., REYNOLDS, R. C., PRINCE, J., and CHAPMAN, C. L. The sensitivity of X-irradiated cells to ultraviolet radiation. Tex. Rep. Biol. Med. 22(3):556-565. Fall 1964.
526. MONTGOMERY, P. O'B., NEUMEYER, B., and ROSENBLUM, E. Ultra-structural alterations induced in E. coli by gravity. Aerosp. Med. 35(4):360-361. Apr. 1964.
527. MONTGOMERY, P. O'B., PRINCE, J., COOK, J. E., and REYNOLDS, R. C. Photo-protection and human malignant cells. Tex. Rep. Biol. Med. 22(1):152-155. Spring 1964.
528. MONTGOMERY, P. O'B., and REYNOLDS, R. C. Cellular and sub-cellular responses to ultraviolet radiation. Lab. Invest. 13(10):1234-1253. Oct. 1964.
529. MONTGOMERY, P. O'B., ROSENBLUM, E., and STAPP, B. Gravity, radiation and growth. Aerosp. Med. 35(8):731-733. Aug. 1964.
530. MONTGOMERY, P. O'B., STAPP, B., and ROSENBLUM, E. A comparison of the ultrastructural changes produced in bacteria by gravity and X-radiation. Fed. Proc. 23(2, Pt. 1):441. Mar.-Apr. 1964.
531. MOORE, B. G., and TISCHER, R. G. Biosynthesis of extracellular polysaccharides by the blue-green alga Anabaena flosaquae. Can. J. Microbiol. 11:877-885. 1964.
532. MOORE, B. G., and TISCHER, R. G. Extracellular polysaccharides of algae: effects on life-support systems. Science 145(3632):586-587. 1964.

533. MOORE, B. G., and TISCHER, R. G. Palmellococcus species as a carbon-energy source for the growth of Torula utilis. Develop. Ind. Microbiol. 5:316-325. 1964.
534. MORTIMER, R. K., BRUSTAD, T., and CORMACK, D. V. Effectiveness of ionizing radiations for induction of mutations and lethality in diploid Saccharomyces cerevisiae, in relation to ionization density and oxygen tension. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11387, p. 35-53. Sept. 1964.
535. MUSACCHIA, X. J., and FOX, A. M. Intestinal absorption and effects of radiation in the hibernator Citellus tridecemlineatus. Fed. Proc. 23(2, Pt. 1):972. 1964.
536. PACE, N. The effects of weightlessness on mammals. In F. A. Gilfillan, ed. Space Biology, p. 65-74. Proceedings of the 24th Annual Biology Colloquium. Corvallis, Oregon State University Press, 1964.
537. PACE, N., HANSEN, J. T., RAHLMANN, D. F., BARNSTEIN, N. J., and CANNON, M. D. Preliminary observations of some physiological characteristics of the pig-tailed monkey, Macaca nemestrina. Aerosp. Med. 35:118-121. 1964.
538. RAHLMANN, D. F., HANSEN, J. T., PACE, N., BARNSTEIN, N. J., and CANNON, M. D. Handling procedures and equipment for physiological studies on the pig-tailed monkey (Macaca nemestrina). Lab. Anim. Care 14:125-130. 1964.
539. REYNOLDS, R. C., and MONTGOMERY, P. O'B. Nucleolar alterations produced by Actinomycin D and 4-nitroquinoline N-oxide. Proc. Amer. Ass. Cancer Res. 5(1):53. (Abstr.) Mar. 1964.
540. REYNOLDS, R. C., MONTGOMERY, P. O'B., and HUGHES, B. Nucleolar "caps" produced by Actinomycin D. Cancer Res. 24(7):1269-1277. Aug. 1964.
541. SALISBURY, F. B. Exobiology. In G. J. D. Schock, ed. Proceedings of the First Annual Rocky Mountain Bioengineering Symposium, p. 75-83. Colorado Springs, Colo., United States Air Force Academy, 1964.
542. SALISBURY, F. B. Das Mars-Paradoxon. [Mars - Paradox]. Naturwiss. Med. 1(5):36-50. 1964.
543. SALISBURY, F. B. A special-purpose controlled-environment unit. Bot. Gaz. 125(4):237-241. 1964.
544. SALISBURY, F. B., and SPOMER, G. G. Leaf temperatures of alpine plants in the field. Planta (Berlin) 60:497-505. 1964.
545. SCHNEIDER, E. G., ROBINSON, S., and NEWTON, J. L. The oxygen debt in aerobic work. Physiologist 7:247. 1964.

546. SIEGEL, S. M., GUIMARRO, C., and LATTERELL, R. Behavior of plants under extraterrestrial conditions: seed germination in atmospheres containing nitrogen oxides. *Proc. Nat. Acad. Sci.* 52(1): 11-13. July 1964. 4 Refs.
547. SIEGEL, S. M., GUIMARRO, C., and RENWICK, G. M. Hydrogen metabolism in higher plants. *Plant Physiol.* 39(3):303-306. May 1964. 13 Refs.
548. SIEGEL, S. M., HALPERN, L. A., and GUIMARRO, C. Germination and seedling growth of winter rye in deuterium oxide. *Nature* 201 (4925):1244-1245. Mar. 21, 1964. 7 Refs.
549. SLATER, J. V., LYMAN, J. T., TOBIAS, C. A., AMER, N. M., BECK, J. S., BECK, M., and SLATER, A. J. Heavy ion localization of sensitive embryonic sites in Tribolium. *Radiat. Res.* 21:541-549. 1964.
550. SONDHaus, C. A., WALLACE, R. W., LYMAN, J. T., KASE, K. W., and STEWARD, P. G. Physical parameters in exposure of large animals to high-energy protons. In *Biological Effects of Neutron and Proton Irradiations*, Vol. 1, p. 231-247. Vienna, International Atomic Energy Agency, 1964.
551. SOROKIN, C. Aging at the cellular level. *Experientia* 20:353-362. 1964.
552. SOROKIN, C. Buffering activity of algal cells and its effect on cell division. *Exp. Cell Res.* 33:508-515. 1964.
553. SOROKIN, C. Organic synthesis in algal cells separated into age groups by fractional centrifugation. *Arch. Mikrobiol.* 49:193-208. 1964.
554. SOROKIN, C. Temperature tolerance: algae. In P. L. Altman and D. S. Ditmer, eds. *Biology Data Book*, Federation of American Societies for Experimental Biology, 1964.
555. TISCHER, R. G., and MOORE, B. G. An extracellular polysaccharide produced by Palmella mucosa Kutz. *Arch. Mikrobiol.* 49:158-166. 1964.
556. TOBIAS, C. A., LAWRENCE, J. H., LYMAN, J., BORN, J. L., GOTTSCHALK, A., LINFOOT, J., and McDONALD, L. Progress report on pituitary irradiation. In T. J. Haley and R. S. Snider, eds. *Response of the Nervous System to Ionizing Radiation*, p. 19-35. Boston, Little, Brown, 1964.
557. TOBIAS, C. A., and TODD, P. W. Analysis of the effects of high-LET radiations on various biological test objects. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11387, p. 25-34. Sept. 1964.
558. TOBIAS, C. A., and TODD, P. Analysis of the effects of high-LET radiations on various strains of cells. In *Biological Effects of Neutron and Proton Irradiations*, Vol. 2, p. 410-428. Vienna, International Atomic Energy Agency, 1964.

559. TYM, R., and TODD, P. W. The sensitization by iododeoxyuridine of cultured human cells to the lethal effect of X-rays and heavy ions. *Int. J. Radiat. Biol.* 8:589-603. 1964.
560. VIERECK, E. G., and MORRISON, P. Growth rate and the development of temperature regulation in the tundra vole, Microtus oeconomus. *In Science in Alaska*, p. 37-38. 1964.
561. WARD, C. H., MOYER, J. E., and VELA, G. R. Studies on bacteria associated with Chlorella pyrenoidosa TX71105 in mass culture. *Develop. Ind. Microbiol.* 6:213-222. 1964. 12 Refs.
562. WARMAN, N. E. A subminiature temperature transmitter for use with rodents. *In Science in Alaska*, p. 46-47. 1964.
563. WEISS, H. S., PILMER, R. A., WRIGHT, R. A., WHARTON, C. R., and HILATT, E. P. Resistance of the chick to oxygen toxicity. *Fed. Proc.* 23(2):522. 1964.
564. WESTHOFF, D. D., and MUSACCHIA, X. J. Intestinal absorption of sugar and effects of Co<sup>60</sup> irradiation in ground squirrel, Citellus tridecemlineatus. *Physiologist* 7(3):284. 1964.
565. WRIGHT, R. A., LESSLER, M. A., and WEISS, H. S. Metabolism and X-ray sensitivity of chick embryos incubated in a helium-oxygen atmosphere. *Aerosp. Med.* 35(3):284. 1964.
566. WURTH, M. A., and MUSACCHIA, X. J. Renewal of intestinal epithelium in fresh water turtle, Chrysemys picta. *Anat. Rec.* 148:427-429. 1964.
567. WYARD, S. J. On the spatial distribution of radicals produced by irradiation. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 11387, p. 1-7. Sept. 1964.

## 1965

577. BEISCHER, D. E. Biomagnetics. *In Civilian and Military Uses of Aerospace.* *Ann. N. Y. Acad. Sci.* 134:454-458. 1965.
578. BEISCHER, D. E. Experimental effects of very low and very high field strength. (Abstr.) *Amer. Psychol.* 20:564. 1965.
579. BESCH, E. L., SMITH, A. H., and GOREN, S. Effect of accelerative forces on avian embryogenesis. *J. Appl. Physiol.* 20:1232-1240. 1965.
580. BESCH, E. L., SMITH, A. H., and WALKER, M. W. Morphological changes in avian eggs subjected to accelerative force. *J. Appl. Physiol.* 20:1241-1248. 1965.
581. BEYERS, R. J. The pattern of photosynthesis and respiration in laboratory microecosystems. *Mem. Inst. Ital. Idrobiol.* 18 (Suppl.):61-74. 1965.



582. BURTON, R. R., and SMITH, A. H. Chronic acceleration sickness. *Aerosp. Med.* 36:39-44. 1965.
583. DEDOLPH, R. R., BREEN, J. J., and GORDON, S. A. Geoelectric effect and geotropic curvature. *Science* 148(3673):1100-1101. 1965.
584. ESKIN, A., and RICCIO, D. C. Changes in spontaneous activity as a measure of sensitivity to rotation in the white rat. U. S. Naval Res. Inst., Bureau of Medicine and Surgery, Pensacola, Fla., MR005.13-6001 Subtask 1, Report No. 103. 1965. (NASA Order R-93)
585. ESKIN, A., and RICCIO, D. C. The effects of environmental temperature changes on the EKG of the squirrel monkey (Saimiri sciureus). U. S. Naval Med. Res. Inst., Bureau of Medicine and Surgery, Pensacola, Fla., MR005.13-9010 Subtask 5, Report No. 2. 1965. (NASA Order R-39)
586. GATES, D. M. Energy exchange in the biosphere. First International Symposium on Ecosystems, Copenhagen, Proceedings by UNESCO. 1965.
587. GRUNBAUM, B. W. A self-contained and portable laboratory for microchemical analysis. *Microchem. J.* 9:371-383. 1965.
588. GRUNBAUM, B. W., and PACE, N. Microchemical urinalysis. I. Simplified determinations of ammonia, urea, creatinine, creatine, phosphate, uric acid, glucose, chloride, calcium and magnesium. *Microchem. J.* 9:166-183. 1965.
589. GRUNBAUM, B. W., and PACE, N. Microchemical urinalysis. II. Microturbidimetric determination of sulfate. *Microchem. J.* 9:184-186. 1965.
590. GRUNBAUM, B. W., PACE, N., and CANNON, M. D. Microchemical urinalysis. III. A simple automatic recording time-flow titrator. *Microchem. J.* 9:187-192. 1965.
591. HENRIKSEN, T. Effect of the irradiation temperature on the production of free radicals in solid biological compounds exposed to various ionizing radiations. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 16281. July 20, 1965.
592. HENRIKSEN, T. Free radical induced in enzymes by electrons and heavy ions. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 16358. Aug. 23, 1965.
593. HENRIKSEN, T. Production of free radicals in solid biological substances by heavy ions. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 16280. July 20, 1965.

594. HOCK, R. J., ROBERTS, J. C., and SMITH, R. E. Brown fat and thermoregulation in deer mice at altitude. *Physiologist* 8:195. 1965.
595. KENT, K. M., and POPOVIC, V. P. Cardiovascular responses in hypothermia and hibernation. *Physiologist* 8:318. 1965.
596. KOK, B., and DATKO, E. A. Reducing power generated in the second photoact of photosynthesis. *Plant Physiol.* 40:1171-1177. 1965.
597. KOK, B., and RURAINSKI, H. J. Plastocyanin photo-oxidation by detergent-treated chloroplasts. *Biochim. Biophys. Acta* 94:588-590. 1965.
598. KOK, B., RURAINSKI, H. J., and OWENS, O. V. H. The reducing power generated in photoact I of photosynthesis. *Biochim. Biophys. Acta* 109:347-356. 1965.
599. KOLLIAS, J., and JORDAN, J. P. An improved system for prolonged exposure of small animals to low pressure-artificial atmospheres. *J. Appl. Physiol.* 20:742. 1965.
600. LATTERELL, R. L., and SIEGEL, S. M. Differential losses of seed viability conditioned by chemically inert gases. *Amer. J. Bot.* 52(6, Pt. 2):622-623. (Abstr.) July 1965.
- \*601. LYMAN, J. T. Acute cellular effects of heavy charged particle irradiations. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 16456. Oct. 13, 1965.
602. LYON, C. J. Action of gravity on basipetal transport of auxin. *Plant Physiol.* 40(5):953-961. Sept. 1965. 19 Refs.
603. LYON, C. J. Auxin transport in geotropic curvatures of a branched plant. *Plant Physiol.* 40(1):18-24. Jan. 1965. 14 Refs.
604. McDONALD, L. W., KING, G. A., and TOBIAS, C. A. Radiosensitivity of the vestibular apparatus of the rabbit. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 16246, p. 74-83. Sept. 1965.
605. MONTGOMERY, P. O'B., COOK, J. E., and FRANTZ, R. The effects of prolonged centrifugation on Amoeba proteus. *Exp. Cell Res.* 40(1):140-142. Oct. 1965.
606. MONTGOMERY, P. O'B., COOK, J. E., and KARNEY, D. Ultraviolet microbeam irradiation of living cell membranes. *J. Cell Biol.* 26(3):959-961. Sept. 1965.
607. MUSACCHIA, X. J., GROSS, W. W., WURTH, M. A., and MUSACCHIA, B. C. Intestinal function and the role of hibernators in biosatellite experiments. *Proc. Mo. Acad. Sci.* 11:89-90. 1965.

608. MUSACCHIA, X. J., WESTHOFF, D. D., and BRAMANTE, A. V. Intestinal absorption of sugars in the hibernator, Citellus tridecemlineatus. Fed. Proc. 24(2):2527. 1965.
609. NAQVI, S. M., DEDOLPH, R. R., and GORDON, S. A. Auxin transport and geoelectric potential in corn coleoptile sections. Plant Physiol. 40(5):966-968. 1965.
610. NEWTON, J. L., and ROBINSON, S. Distribution of blood lactate and pyruvate during work and recovery. Fed. Proc. 24:590. 1965.
611. ODA, N., and LYMAN, J. T. Secondary electron distribution for heavy ions. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 16405. Sept. 15, 1965.
612. OSRETKAR, A., and KRAUSS, R. W. Growth and metabolism of Chlorella pyrenoidosa chick during substitution of Rb for K. J. Phycol. 1:23-34. 1965.
613. PACKER, E. L., INGRAHAM, J. L., and SCHER, S. Factors affecting the rate of killings of Escherichia coli by repeated freezing and thawing. J. Bacteriol. 89(3):718-724. Mar. 1965.
614. PANUSKA, J. A., and POPOVIC, V. P. Critical temperature for instrumental response acquisition in hypothermic rats. J. Appl. Physiol. 20:1275-1277. 1965.
615. PATTERSON, G. W., and KRAUSS, R. W. Hydrocarbons and sterols from Chlorella. Plant Physiol. 40, Suppl. XVIII. 1965.
616. PATTERSON, G. W., and KRAUSS, R. W. Sterols of Chlorella. I. The naturally-occurring sterols of Chlorella vulgaris, C. ellipsoidea, and C. saccharophila. Plant Cell Physiol. 6(2):211-220. 1965.
617. PATTERSON, W. H., and WALLACE, R. Report on a radiation survey made in Egypt, India, and Ceylon in January 1963. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 10851 Rev. Oct. 1965.
618. POPOVIC, P., and POPOVIC, V. P. Survival of young rats after supercooling to -3C. Cryobiology 2:23. 1965.
619. POPOVIC, P., SILVER, A. B., and POPOVIC, V. P. Critical body temperature for intracranial self-stimulation in white rats. Physiologist 8:320. 1965.
620. POPOVIC, V. P. Effect of hypothermia on growth and development of tumors. Abstract of the 23rd International Physiology Congress, p. 294. 1965.
621. POPOVIC, V. P., and KENT, K. M. Cardiovascular responses in prolonged hypothermia. Amer. J. Physiol. 209:1069-1074. 1965.
622. POPOVIC, V. P., and MASIRONI, R. Disappearance of euthermic tumors after 10-hour generalized hypothermia. Life Sciences 4:533-543. 1965.

623. POPOVIC, V. P., and MASIRONI, R. Disappearance of euthermic tumors (37°C) in shallow hypothermia. *Physiologist* 8:315. 1965.
624. RESCIGNO, A., and SEGRE, G. On some metric properties of the systems of compartments. *Bull. Math. Biophys.* 21:315-323. 1965.
625. REYNOLDS, R. C., and MONTGOMERY, P. O'B. Nucleolar and cytoplasmic alterations produced by Actinomycin D and other metabolic inhibitors, an electron microscopic and time-lapse study. (Abstr.) *Proc. Amer. Ass. Cancer Res.* 6:53. 1965.
626. RHODES, R. A., WEISS, H. S., WRIGHT, R. A., and HIATT, E. P. Depression of metabolism in animals transferred from a helium-oxygen environment to air. *Fed. Proc.* 24(2):215. 1965.
627. SIEGEL, S. M. Effects of oxidants and ionizing conditions on seed germination at subatmospheric oxygen levels. *Bot. Gaz.* 125 (4):241-245. 1965. 7 Refs.
628. SIEGEL, S. M., and DALY, O. Responses of Cladonia rangiferina to environmental stress factors: temperature, radiation and water. *Plant Physiol.* 40(Suppl.):20. Aug. 1965.
629. SIEGEL, S. M., DALY, O. W., and DAVIS, G. General and comparative biology of experimental atmospheres and other stress conditions: experiments with the turtle, Pseudemys scripta-elegans. *Aerosp. Med.* 36(4):363-368. Apr. 1965. 8 Refs.
630. SIEGEL, S. M., DALY, O., and GUIMARRO, C. Experimentation with plants at sub-atmospheric oxygen-levels: effects of oxygen pressure and salts on germination of winter rye. *Nature* 208 (5014):1012-1013. Dec. 4, 1965. 6 Refs.
631. SIEGEL, S. M., and GUIMARRO, C. Survival and growth of terrestrial microorganisms in ammonia-rich atmospheres. *Icarus* 4(1):37-40. Feb. 1965. 9 Refs.
632. SLUKA, S. J., BESCH, E. L., and SMITH, A. H. A hydrostatic pressure tester of egg shell strength. *Poultry Sci.* 44:1494-1500. 1965.
633. SMITH, A. H., and BURTON, R. R. Persistence of adaptation to chronic acceleration. *Physiologist* 8:273. 1965.
634. SMITH, A. H., and KELLY, C. F. Biological effects of chronic acceleration. *Naval Res. Rev.* 18:1-11. 1965.
635. SMITH, R. E., and ROBERTS, J. C. Time dependent responses of brown fat in cold-exposed rats. *Physiologist* 8:275. 1965.
636. SONDHAUS, C. A. Effect of high-energy protons and alpha particles on small mammals. In A. Reetz, Jr., ed. *Second Symposium on Protection Against Radiations in Space*, p. 97-103. Washington, D. C., National Aeronautics and Space Administration, 1965.

637. SOROKIN, C. Carbon dioxide and cell division. Nature 206:35-37. 1965.
638. SOROKIN, C. Photosynthesis in cell development. Biochim. Biophys. Acta 94:42-52. 1965.
639. SOROKIN, C. Van Slyke's buffer values for cell secretions. Protoplasma 60:79-85. 1965.
640. SOROKIN, C., and KRAUSS, R. W. The dependence of cell division in Chlorella on temperature and light intensity. Amer. J. Bot. 52(1):331-339. 1965.
641. STEWARD, P. G. Results of computations of depth dose in tissue irradiated by protons. Berkeley, California, University of California, Donner Laboratory and Donner Pavilion, UCRL 16154. May 25, 1965.
642. THORNTON, P. A. The effect of immobilization on skeletal metabolism in guinea pigs with varying bone thickness. Physiologist 8:288. 1965.
643. THORNTON, P. A. Skeletal changes with age. Gerontologist 5:18. 1965.
644. TISCHER, R. G. Pure culture of Anabaena flos-aquae A-37. Nature 205:419-420. 1965.
645. TODD, P. W. Biological effects of heavy ions. In A. Reetz, Jr., ed. Second Symposium on Protection Against Radiations in Space, p. 105-114. Washington, D. C., National Aeronautics and Space Administration, 1965.
646. VOGT, F. B., MACK, P. B., BEASLEY, W. G., SPENCER, W. A., CARDUS, D., and VALBONNA, C. The effect of bed rest on bone mass and calcium balance. Bulletin of the Texas Institute of Rehabilitation and Research. Apr. 1965.
647. WALLACE, R., STEWARD, P. G., and SONDHAAUS, C. Primary - and secondary - proton dose rates in spheres and slabs of tissue. In A. Reetz, Jr., ed. Second Symposium on Protection Against Radiations in Space, p. 301-329. Washington, D. C., National Aeronautics and Space Administration, 1965.
648. WEISS, H. S., BECKMAN, D., and WRIGHT, R. A. Delayed mortality in the adult chicken exposed to one atmosphere oxygen. Nature 208:1003-1004. 1965.
649. WEISS, H. S., WRIGHT, R. A., and HIATT, E. P. Embryo development and chick growth in a helium-oxygen environment. Aerosp. Med. 36(3):201-206. 1965.
650. WEISS, H. S., WRIGHT, R. A., and HIATT, E. P. Reaction of the chick to one atmosphere of oxygen. J. Appl. Physiol. 20(6):1227-1231. 1965.

651. WOLKEN, J. J. Photoreceptor structures and energy transfer. J. Arkansas Med. Soc. 62:61. July 1965.
652. WRIGHT, R. A., LESSLER, M. A., WEISS, H. S., and HIATT, E. P. Metabolism and X-ray sensitivity of chick embryos incubated in a helium-oxygen environment. Aerosp. Med. 36(4):311-314. 1965.

1966

653. BEISCHER, D. E. Triaxial ballistocardiogram in a weightless environment. Proceedings of First World Congress on Ballistocardiography and Cardiovascular Dynamics, Amsterdam, Netherlands, 1965, p. 85-89. Basel/New York, Karger, 1966.
654. BESCH, E. L. Respiratory activity of avian blood cells. J. Cell Comp. Physiol. 67:301-306. 1966.
655. BESCH, E. L., and SLUKA, S. J. Blastoderm location in the avian egg. Poultry Sci. 45:259-262. 1966.
656. BEYERS, R. J. Metabolic similarities between symbiotic coelenterates and aquatic ecosystems. Arch. Hydrobiol. 62:273-284. 1966.
657. CHAFFEE, R. R. J., HORVATH, S. M., SMITH, R. E., and WELSH, R. S. Studies on the cellular biochemistry and organ size of cold and heat acclimated monkeys. Fed. Proc. 25:1177-1181. 1966.
658. CHAFFEE, R. R. J., PENGELLEY, E. T., ALLEN, J. R., and SMITH, R. E. Biochemistry of brown fat and liver of hibernating golden-mantled ground squirrels (*Citellus lateralis*). Can. J. Physiol. Pharmacol. 44:217-223. 1966.
659. CLINE, M. G., and SALISBURY, F. B. Effects of ultraviolet radiation on the leaves of higher plants. Radiat. Bot. 6:151-163. 1966.
660. COSTELLO, L. C., SMITH, W., and FREDRICKS, W. The comparative biochemistry and development of *Ascaris* eggs. VI. Respiration and terminal oxidation during embryonation. Comp. Biochem. Physiol. 18:217-224. 1966.
661. DAVIS, E. B., TISCHER, R. G., and BROWN, L. R. Nitrogen fixation by the blue-green alga *Anabaena flos-aquae* A-37. Physiol. Plant. 19:823-826. 1966.
662. DEDOLPH, R. R., GORDON, S. A., and OEMICK, D. A. Geotropism in simulated low-gravity environments. Amer. J. Bot. 53(6):530-533. 1966.
663. DEDOLPH, R. R., NAQVI, S. M., and GORDON, S. A. Effect of gravity compensation on the geotropic sensitivity of *Avena* seedlings. Plant Physiol. 40(5):961-965. 1966.
664. DEDOLPH, R. R., NAQVI, S. M., and GORDON, S. A. Role of indole-3-acetic acid in modification of geotropic responses in clinostat-rotated *Avena* seedlings. Plant Physiol. 41(5):897-902. 1966.

665. FOSTER, J. F. Carbon dioxide conversion for oxygen recovery. In K. Kammermeyer, ed. Atmosphere in Space Cabins and Closed Environments, p. 104-119. New York, Appleton-Century-Crofts, 1966.
666. FOSTER, J. F. Life support systems and outer space. Battelle Tech. Rev., p. 4-9. Jan. 1966.
667. FOX, E. L., BARTELS, R. L., and HIATT, E. P. Relationship of ambient temperature to body temperature of man in a He-O<sub>2</sub> atmosphere. Fed. Proc. 25(2, Pt. 1):273. 1966.
668. FOX, E. L., WEISS, H. S., BARTELS, R. L., and HIATT, E. P. Thermal responses of man during rest and exercise in a helium-oxygen environment. Arch. Environ. Health 13:23-28. 1966.
670. GATES, D. M., and DERBY, R. The temperature of tree trunks, calculated and observed. Amer. J. Bot. 53(6):580-587. 1966.
671. GATES, D. M., and JANKE, R. The energy environment of the alpine tundra. Oecol. Planta, Gauthier-Villars 1:39-62. 1966.
672. GORDON, S. A., and SHEN-MILLER, J. On the thresholds of gravitational force perception by plants. In A. H. Brown and M. Florin, eds. Life Sciences and Space Research, Vol. IV, p. 22-34. Washington, Spartan Books, 1966.
673. GROSCH, D. S. The combined effects of irradiation, vibration, and centrifugation on braconid fecundity, fertility and life span. In Book of Abstracts, Third International Congress of Radiation Research, p. 99. Cortina D'Ampezzo, Italy. 1966.
674. GRUNBAUM, B. W., and PACE, N. Improved procedure for individual urinary 17-ketosteroids. Fed. Proc. 25:766. 1966.
675. GUMMA, M. R., SOUTH, F. E., and ANDJUS, R. K. Acclimatization to deep hypothermia by rats. Proc. Mo. Acad. Sci. Apr. 1966.
676. HOCK, R. J., and ROBERTS, J. C. Effect of altitude on oxygen consumption of deer mice: relation of temperature and season. Can. J. Zool. 44:365-376. 1966.
677. JORDAN, J. P., ALLRED, J. B., and BOND, A. D. Metabolic adaptation of rats to a high oxygen-low pressure environment. Physiologist 9:214. 1966.
678. JORDAN, J. P., ALLRED, J. B., CAHILL, C. L., and CLARK, R. T. The effect of discontinuous exposure of rats to a high oxygen-low pressure environment. Aerosp. Med. 37:368. 1966.

679. KARLANDER, E. P., and KRAUSS, R. W. Responses of heterotrophic cultures of Chlorella vulgaris Beyerinck to darkness and light. I. Pigment and pH changes. Plant Physiol. 41(1):1-6. 1966.
680. KARLANDER, E. P., and KRAUSS, R. W. Responses of heterotrophic cultures of Chlorella vulgaris Beyerinck to darkness and light. II. Action spectrum for and mechanism of the light requirement for heterotrophic growth. Plant Physiol. 41(1):7-14. 1966.
681. KELLY, C. F., and SMITH, A. H. Chronic acceleration studies - physiological responses to artificial alteration in weight. Apr. 1966. (NASA Publ. CR-441, p. 8)
682. KLAUSEN, K., ROBINSON, S., MICHEAL, E. D., and MYHRE, L. G. Effect of high altitude on maximal working capacity. J. Appl. Physiol. 21:1191-1194. 1966.
683. KNEPTON, J. C., JR. The influence of vibrations on chromosomes. Aerosp. Med. 37(6):608-612. 1966. 10 Refs.
684. KREITH, F., and GATES, D. M. The micro-environment of broad leaf plants - convection, radiation, and transpiration. In Institute of Environmental Sciences 1966 Annual Technical Meeting Proceedings p. 209-213. Boulder, Colo., Univ. of Colorado, Institute of Arctic and Alpine Research, 1966. (Contrib. No. 26)
685. LATTERELL, R. L. Nitrogen- and helium-induced anoxia: different lethal effects on rye seeds. Science 153(3731):69-70. July 1, 1966. 7 Refs.
686. MACK, P. B. Radiographic bone densitometry. Conference under sponsorship of the National Aeronautics and Space Administration and the National Institutes of Health, Washington, D. C., Mar. 25-27, 1965. 1966. (NASA SP-64)
687. MONTGOMERY, P. O'B. Nucleolar studies. Bull. Path. 7(3):66-67. Mar. 1966.
688. MUSACCHIA, X. J., WESTHOFF, D. D., and BRAMANTE, A. V. Effects of phlorizin on intestinal absorption in vivo and in vitro. Fed. Proc. 25(2):1. 1966.
689. NAQVI, S. M., and GORDON, S. A. Auxin transport in Zea mays L. coleoptiles. I. Influence of gravity on the transport of indoleacetic acid-2-<sup>14</sup>C. Plant Physiol. 41(7):1113-1118. 1966.
690. PARKHURST, D. F., and GATES, D. M. Transpiration resistance and energy budget of Populus sargentii leaves. Nature 210:172-174. 1966.
691. POPOVIC, P., PANUSKA, J. A., and POPOVIC, V. P. Instrumental acquisition in rats after twelve exposures to deep hypothermia. Proc. Soc. Exp. Biol. Med. 122:337-341. 1966.



692. POPOVIC, V., and MASIRONI, R. Disappearance of normothermic tumors in shallow (30°C) hypothermia. *Cancer Res.* 26:863-864. 1966.
693. POPOVIC, V., and MASIRONI, R. Effect of generalized hypothermia on normothermic tumors. *Amer. J. Physiol.* 211:462-466. 1966.
694. POPOVIC, V., and MASIRONI, R. Enhancement of 5-fluorocil action on normothermic tumors in generalized hypothermia. *Cancer Res.* 26:863-864. 1966.
- \*695. POPOVIC, V., and MASIRONI, R. Generalized hypothermia enhances anti-cancer drug action on normothermic tumors. *Physiologist* Aug. 1966.
696. RAMKRISHNA, D., FREDRICKSON, A. G., and TSUCHIYA, H. M. Dynamics of microbial growth. A distributed structured model. *J. Ferment. Tech.* 44:210-217. 1966.
- \*697. RENO, V. R. Sea urchin mitosis in high magnetic fields. U. S. Naval Med. Res. Inst., Bureau of Medicine and Surgery, Pensacola, Fla., MR005.13-9010 Subtask 1, Report No. 9. 1966. (NASA Order R-39)
698. ROBERTS, J. C., HOCK, R. J., and SMITH, R. E. Seasonal metabolic responses of deer mice (Peromyscus) to temperature and altitude. *Fed. Proc.* 25:1275-1285. 1966.
699. SHEN-MILLER, J., and SHARP, W. R. An improved medium for rapid initiation of Arabidopsis tissue culture from seed. *Bull. Torrey Bot. Club* 93(1):68-69. Jan.-Feb. 1966.
700. SIEGEL, S. M., and GUIMARRO, C. On the culture of a microorganism similar to the Precambrian microfossil Kakabekia umbellata Barghoorn in NH<sub>3</sub>-rich atmospheres. *Proc. Nat. Acad. Sci.* 55 (2):349-353. Feb. 1966. 8 Refs.
701. SIEGEL, S. M., GUIMARRO, C., and DALY, O. W. Micro-aerobic capabilities in land plants: observations on survival and growth of plants submerged in fresh and saline waters. *Nature* 209 (5030):1330-1334. Mar. 26, 1966. 17 Refs.
702. SLUKA, S. J., SMITH, A. H., and BESCH, E. L. Orientation in systems with asymmetric density distribution. *Biophys. J.* 6:175-199. 1966.
703. SOUTH, F. E., ANDJUS, R. K., and GUMMA, M. R. Acclimatization to deep hypothermia by rats. *Fed. Proc.* 25:2. 1966.
704. SWAN, H., and HALL, F. G. Oxygen-hemoglobin dissociation in Protopterus aethiopicus. *Amer. J. Physiol.* 210(3):487-489. Mar. 1966. 4 Refs.
705. SWEENEY, K. Photosynthetic halophiles from Owens Lake. Washington, D. C., Nat. Aeron. and Space Adminis., Jan. 1966, 71 p. Refs. (STAR N66-14905)

706. THORNTON, P. A., and OMDAHL, J. L. The influence of age on skeletal response to immobilization and ascorbic acid deficiency. In 7th International Congress of Gerontology, June 26-July 2, p. 15-23. 1966.
707. TSUCHIYA, H. M., FREDRICKSON, A. G., and ARIS, R. Dynamics of microbial cell populations. Adv. Chem. Eng. 6:124-205. New York, Academic Press. 1966.
708. VELA, G. R., and GUERRA, C. N. On the nature of mixed cultures of Chlorella pyrenoidosa TX71105 and various bacteria. J. Gen. Microbiol. 42:123-131. 1966. 18 Refs.
709. WOLKEN, J. J. Lipids and the molecular structure of photoreceptors. J. Amer. Oil Chem. Soc. 43(5):271-274. 1966.
710. WRIGHT, R. A., HIATT, E. P., and WEISS, H. S. Mortality and histopathology of germ-free rats and mice exposed to 100% oxygen. Proc. Soc. Exp. Biol. Med. 122(2):446-448. 1966. 11 Refs.
711. WRIGHT, R. A., KREGLOW, E. S., and WEISS, H. S. The effects of changing environmental factors in embryonic development in a He-O<sub>2</sub> atmosphere. Aerosp. Med. 37(3):309. 1966.
712. WRIGHT, R. A., WEISS, H. S., HIATT, E. P., and RUSTAGI, J. S. Risk of mortality in interrupted exposure to 100% oxygen: role of air vs. lowered pO<sub>2</sub>. Amer. J. Physiol. 210(5):1015-1020. 1966.
713. WRIGHT, R. W., WEISS, H. S., and RUSTAGI, J. S. Air vs. lowered pO<sub>2</sub> in interrupted exposure to 100% oxygen. Fed. Proc. 25(2, Pt. 1): 566. 1966.
714. ZIOBRO, M., and DeCICCO, B. T. A method for the determination of low frequency transformations with Hydrogenomonas facilis. Bacteriol. Proc., p. 30. 1966.

#### No Date of Publication

715. KENT, K. M., and POPOVIC, V. Circulation in hypothermic and hibernating animals. Proceedings of the Fourth International Biometeorology Congress, Aug. 1966.
716. POPOVIC, V., and KENT, K. M. Factors limiting survival in hypothermic animals. Proceedings of the International Microcirculation Conference, Cambridge, 1966.
717. SIEGEL, S. M., and others. Constitutional changes in plants grown under environmental stress and their implications for aerospace biology. Institute of Food Technologists, 24th Annual Meeting. Washington, D. C., May 1964, p. 78.
718. VOGT, F. B., MACK, P. B., and JOHNSON, P. C. Tilt table response and blood volume changes associated with thirty days of recumbency.

In Press

1966

- \*719. BONGERS, L. Bioregeneration in a closed ecological system. In Ecological Technology, Space - Earth - Sea. 1966.
- \*720. BONGERS, L. Phosphorylation in hydrogen bacteria. J. Bacteriol. 1966.
- \*721. DEDOLPH, R. R., WILSON, B. R., BREEN, J. J., and CHORNEY, W. Simulated low-gravity environments and respiratory metabolism in *Avena* seedlings. Plant Physiol. 1966.
- \*722. EAKMAN, J. M., FREDRICKSON, A. G., and TSUCHIYA, H. M. A model for microbial population statistics and dynamics. AIChE Chem. Eng. Prog. Symp. Ser. Vol. Bioengineering, 1966.
- \*723. GISOLFI, C., ROBINSON, S., and TURRELL, E. S. Effects of aerobic work performed during recovery from exhausting work. J. Appl. Physiol. 21: ? . 1966.
- \*724. HOWELL, J. A., FREDRICKSON, A. G., and TSUCHIYA, H. M. Optimal and dynamic characteristics of a continuous photosynthetic algal gas exchanger. AIChE Chem. Eng. Prog. Symp. Ser. Vol. Photoreactor Design, 1966.
- \*725. JONES, L. W., and KOK, B. Photoinhibition of chloroplast reactions. I. Kinetics and action spectra. Plant Physiol. 1966.
- \*726. JONES, L. W., and KOK, B. Photoinhibition of chloroplast reactions. II. Multiple effects. Plant Physiol. 1966.
- \*727. KOK, B., and CHENIAE, G. M. Kinetics and intermediates of the oxygen evolution step in photosynthesis. In R. Sanadi, ed. Current Topics in Bioenergetics, Vol. I. 1966.
- \*728. LESSLER, M. A., and WRIGHT, R. A. X-ray sensitivity of chick embryos incubated in helium-oxygen. Abstracts of the Third International Congress on Radiation Research, p. 140. 1966.
- \*729. LYON, C. J., and YOKOYAMA, K. Orientation of wheat seedling organs in relation to gravity. Plant Physiol. 1966.
- \*730. MICKELSON, J. C., DAVIS, E. B., and TISCHER, R. G. The effect of various nitrogen sources upon heterocyst formation in Anabaena flos-aquae A-37. J. Exp. Bot. 1966.
- \*731. MUSACCHIA, X. J., BARR, R. E., WESTHOFF, D. D., and MUSACCHIA, B. C. Glucose intestinal transport and absorption following whole body irradiation in hamsters and ground squirrels. Proceedings of the Third International Congress on Radiation Research. Cortina D'Ampezzo, Italy. 1966.

732. MUSACCHIA, X. J., and BRAMANTE, A. V. Intestinal absorption in hamsters and ground squirrels, in vivo. In K. C. Fisher, A. R. Dawe, C. P. Lyman, E. Schonbaum, and F. E. South, eds. Proceedings of the Third International Symposium on Natural Mammalian Hibernation, Toronto, Canada. Oliver and Boyd, Edinburgh. 1966.
733. RAMKRISHNA, D., FREDRICKSON, A. G., and TSUCHIYA, H. M. Dynamics of microbial propagation considering inhibitors and variable cell composition. Bioeng. Biotech. 1966.
734. RENO, V. R., and BEISCHER, D. E. Cardiac excitability in high magnetic fields. Aerosp. Med. 1966.
735. SALISBURY, F. B. The possibilities of life on Mars. Symposium on the exploration of Mars and Venus, presented at Virginia Polytechnic Institute, Blacksburg, Virginia, 1965. 1966.
736. SALISBURY, F. B., SPOMER, G., and SOBRAL, M. Analysis of an alpine environment. Bot. Gaz. 1966.
737. SOUTH, F. E., and HOUSE, W. A. Energy metabolism in hibernation. In K. C. Fisher, A. R. Dawe, C. P. Lyman, E. Schonbaum, and F. E. South, eds. Proceedings of the Third International Symposium on Natural Mammalian Hibernation, Toronto, Canada. Oliver and Boyd, Edinburgh. 1966.
738. SWANSON, C. H., ARIS, R., FREDRICKSON, A. G., and TSUCHIYA, H. M. Bacterial growth as an optimal process. J. Theor. Biol. 1966.
739. WESTHOFF, D. D., and MUSACCHIA, X. J. Active transport of D-galactose and concomitant metabolic activity of small intestine of the hibernator Citellus tridecemlineatus. Proceedings of the Missouri Academy of Science. 1966.

1967

740. BEYERS, R. J. A pH-carbon dioxide method for measuring aquatic primary productivity in fresh water. 1967.
741. COOKE, G. D., BEYERS, R. J., and ODUM, E. P. The case for the multi-species ecological system, with special reference to succession and stability. In Proceedings of NASA Conference on Bioregenerative Systems, Washington, D. C., Nov. 15-16, 1966. 1967.
742. McFADDEN, B. A., KUEHN, G. D., and HOMANN, H. R.  $C^{14}O_2$  fixation, glutamate labeling and the Krebs cycle in ribose-grown Hydrogenomonas facilis. J. Bacteriol. Mar. 1967.
743. McFADDEN, B. A., and TU, C. L. Regulation of autotrophic and heterotrophic  $CO_2$  fixation in Hydrogenomonas facilis. Ribulosediphosphate carboxylase, phosphoribulokinase and ATP, NADH-dependent  $CO_2$  fixation. J. Bacteriol. Mar. 1967.

In Press

No Date Given

- \*744. BARNSTEIN, N. J., GILFILLAN, R. S., PACE, N., and RAHLMANN, D. F. Chronic intravascular catheterization: a technique for implanting and maintaining arterial and venous catheters in laboratory primates. J. Surg. Res.
- \*745. BOND, A. D., JORDAN, J. P., and ALLRED, J. B. Metabolic changes in rats exposed to an oxygen-enriched environment. Amer. J. Physiol.
- \*746. BONGERS, L., and MEDICI, J. C. Chemosynthetic metabolism of Hydrogenomonads. In Proceedings of the Bioregenerative Systems Conference of AIBS/NASA, 1966.
- \*747. BOWERS, R. W., MATHEWS, D. K., and FOX, E. L. Metabolic and thermal responses of man during exposure to He-O<sub>2</sub> and air gaseous mixtures. Physiologist.
- \*748. BURTON, R. R., BESCH, E. L., and SMITH, A. H. The erythrocyte sedimentation test in domestic fowl. Poultry Sci.
- \*749. CALLOWAY, D. H., and KUMAR, A. M. Hydrogenomonas eutropha as a source of protein. Presented at the Second International Congress of Food Science and Technology, Warsaw, Poland, Aug. 22-27, 1966.
- \*750. COSTELLO, L. C., SMITH, W., and OYA, H. The comparative biochemistry and development of *Ascaris* eggs. VII. Malate oxidation and metabolism in unembryonated eggs. Comp. Biochem. Physiol.
- \*751. DEDOLPH, R. R. The influence of simulated low gravity environments on growth, development, and metabolism of plants. In Life Sciences and Space Research, Vol. V. Proceedings of the Seventh International Space Sciences Symposium, Vienna, Austria, 1966.
- \*752. FOSTER, J. F., and LITCHFIELD, J. H. The effects of controlled environment on the growth of *Hydrogenomonas* bacteria in continuous cultures. Paper presented at a Conference on the Closed Life Support System at Ames Research Center, NASA, Apr. 15, 1966.
- \*753. GOLDNER, B. H., and DITTMAN, J. B. Growth of Hydrogenomonas eutropha in urine for application to a bioregenerative life support system. Proceedings of the Conference on Bioregeneration Systems, 1966.
- \*754. INGRAHAM, J. L., and MAALØE, O. Cold sensitive mutants at a minimum temperature of growth of bacteria. Molecular mechanisms of temperature adaptation.
- \*755. MONTGOMERY, P. O'B., REYNOLDS, R. C., and COOK, J. E. Nucleolar "caps" induced by flying spot ultraviolet nuclear irradiation. Amer. J. Pathol.

756. MORRISON, P. R. Temperature selection in Alaskan microtines. Proceedings of the Fourth International Biometeorologists Congress, Rutgers, Aug. 1966.
757. MORRISON, P., and WARMAN, N. A thermal-gradient chamber for small animals with digital output. Med. Elec. Biol. Eng.
758. POPOVIC, P., HORECKY, J., and POPOVIC, V. P. Extracorporeal circulation in hypothermic rats. J. Physiol.
759. POPOVIC, P., HORECKY, J., and POPOVIC, V. P. Hypothermic cardiopulmonary bypass in white rats. Amer. J. Physiol.
760. POPOVIC, P., HORECKY, J., and POPOVIC, V. P. Retention (memory) and motor performance after hypothermic cardiopulmonary bypass. Proc. Soc. Exp. Biol. Med.
761. POPOVIC, V. P., and BERGER, R. Implantation of large polyethylene cannulas in the aorta and right ventricle of white rats. Proc. Soc. Exp. Biol. Med.
762. POPOVIC, V. P., and MASIRONI, R. Effects of anti-cancer drugs on normothermic tumors of hypothermic hamsters. J. Physiol.
763. POPOVIC, V. P., and MASIRONI, R. Regression of normothermic tumors after generalized body cooling. Ninth International Cancer Congress.
764. POPOVIC, V. P., SILVER, A. B., and POPOVIC, P. The critical temperature for intracranial self-stimulation in white rats. Amer. J. Physiol.
765. RAHLMANN, D. F., PACE, N., and BARNSTEIN, N. J. Hematology of the pig-tailed monkey, Macaca nemestrina. Folia Primatol.
766. ROBERTS, J. C., and SMITH, R. E. Time dependent responses of brown fat in cold-exposed rats. Amer. J. Physiol.
767. SALISBURY, F. B. Mars as a habitat for life. In N. M. Sisakian, ed. The Populated Cosmos. Moscow, Russia, Science.
768. SIEGEL, S. M. Elements of space biology: an experimental approach to the basic biology of stress. Advances in Space Science and Technology, Vol. 9.
769. SIEGEL, S. M. Modeles terrestres de vie martienne. [Terrestrial models of Martian life]. Encyclopedie de l'Espace. Paris, Editions Rombaldi.
770. SIEGEL, S. M., and DALY, O. W. The experimental biology of ammonia-rich environments. Germination of Alliumseed, a novel capability among angiosperms. Plant Physiol.
771. SMITH, R. E., ROBERTS, J. C., and HITTELMAN, K. J. Non-phosphorylating respiration of mitochondria from brown adipose tissue of rats. Science.

8772. TOBIAS, C. A., AMER, N. M., ASHIKAWA, J. K., LYMAN, J. T., McDONALD, L. W., SLATER, J. V., SONDHaus, C. A., and TODD, P. W. Interactions of radiations and other environmental stresses in biological systems.
8773. WEISS, H. S., WRIGHT, R. A., KREGLOW, E. S., and PITT, J. F. Resistance of the quail, Coturnix japonica, to oxygen toxicity: role of food intake. Physiologist.

# AUTHOR INDEX FOR THE ENVIRONMENTAL BIOLOGY PROGRAM

Aceto, H., Jr.	451	Chorney, W.	721
Adams, L.R.	452	Churchill, B.W.	451
Alden, J.	516	Clark, R.T.	462,678
Allen, J.R.	658	Cline, M.G.	659
Allred, J.B.	462,677,678,745	Close, P.	436
Amer, N.M.	453,487,488,549,772	Cody, R.M.	437,463,508
Andjus, R.K.	675,703	Cook, D.W.	507
Aris, R.	707,738	Cook, J.E.	522,523,527,605,606,755
Ashikawa, J.K.	432,441,454,490,498,772	Cooke, G.D.	741
		Cooper, T.	480
Barnstein, N.J.	482,538,744,765	Cormack, D.V.	534
Barr, R.E.	731	Costello, L.C.	509,660,750
Bartels, R.L.	667,668		
Bauer, W.G.	455	Daly, O.	628,629,630,770
Beasley, W.G.	646	D'Angio, G.J.	510
Beck, J.S.	549	Datko, E.A.	596
Beck, M.	549	Davis, E.B.	661,730
Beckman, D.	648	Davis, G.	629
Beischer, D.E.	434,435,436,442,456,457,458,465,499,500,501,502,517,577,578,653,734	DeCicco, B.T.	714
Berger, R.	761	Dedolph, R.R.	583,609,662,663,664,721,751
Berger, W.C.	438	Derby, R.	670
Besch, E.L.	579,580,632,654,655,702,748	Dines, J.H.	511
Beyers, R.J.	581,656,740,741	Dittman, J.B.	753
Bienert, H.	459,503	Downs, S.W., Jr.	429
Bond, A.D.	677,745		
Bongers, L.	430,460,504,505,506,719,720	Eakman, J.M.	722
Bonner, W.A.	522	Eskin, A.	584,585
Born, J.L.	556		
Bowers, R.W.	747	Foster, J.F.	512,665,666,752
Bramante, A.V.	608,688,732	Fox, A.M.	535
Breen, J.J.	583,721	Fox, E.L.	667,668,747
Brown, A.H.	431,521	Frantz, R.	605
Brown, L.R.	507,661	Fredricks, W.	660
Brustad, T.	475,534	Fredrickson, A.G.	431,455,464,521,696,707,722,724,733,738
Burton, R.R.	461,582,633,748	Furry, D.E.	465,501,513
Cahill, C.L.	462,678	Gaffey, C.T.	514,515
Cannon, M.D.	538,590	Gainey, M.D.	438
Cardus, D.	646	Galloway, R.A.	466,473
Chaffee, R.R.J.	657,658	Gates, D.M.	586,670,671,684,690
Chapman, C.L.	525	Gilfillan, R.S.	744
Cheniae, G.M.	727	Gisolfi, C.	723



Goldner, B.H.	753	Krauss, R.W.	466,473,519,612,615,616,640,679,680
Gordon, S.A.	467,583,609,662,663,664,672,689	Kreglow, E.S.	711,773
Goren, S.	579	Kreith, F.	684
Gottschalk, A.	510,556	Kuehn, G.D.	742
Graybiel, A.	442		
Greenfield, C.	454,498	Latterell, R.	546,600,685
Grosch, D.S.	673	Lawrence, J.H.	510,556
Gross, W.W.	607	Lessler, M.A.	565,652,728
Grunbaum, B.W.	587,588,589,590,674	Linfoot, J.	556
Guerra, C.N.	708	Litchfield, J.H.	512,752
Guimarro, C.	546,547,548,630,631,700,701	Love, D.	490
Gumma, M.R.	675,703	Lowery, R.T.	465
		Lyman, J.	510,549,550,556,601,611,772
Hall, F.G.	704	Lyon, C.J.	474,602,603,729
Halpern, L.A.	548		
Hansen, J.T.	439,468,469,482,538	Maale, O.	754
Henriksen, T.	591,592,593	McClendon, D.	524
Hiatt, E.P.	497,511,516,563,626,649,650,652,667,668,710,712	McDonald, L.	556,604,772
Hittelman, K.J.	711	McFadden, B.A.	742,743
Hixon, W.C.	429,517	Mack, P.B.	646,686,718
Hoch, G.	470,518	Manney, T.R.	475
Hock, R.J.	594,676,698	Maqsood, M.	432,441
Homann, H.R.	742	Masironi, R.	622,623,692,693,694,695,762,763
Horecky, J.	758,759,760	Mathews, D.K.	747
Horvath, S.M.	657	Meek, J.C.	442
House, W.A.	737	Mellor, R.S.	520
Howard, J.	454	Micheal, E.D.	682
Howell, J.A.	724	Mickelson, J.C.	730
Hughes, B.	478,540	Miller, E.F.	435
		Miller, R.L.	431,521
Ingraham, J.L.	613,754	Minton, P.D.	525
		Montgomery, P.O'B.	476,477,478,479,486,522,523,524,525,526,527,528,529,530,539,540,605,606,625,687,755
Janke, R.	671	Moore, B.G.	531,532,533,555
Jellinek, M.	480	Morrison, P.	560,756,757
Jenkins, T.	440	Mortimer, R.K.	534
Johnson, P.C.	718	Moyer, B.J.	443
Jones, L.W.	725,726	Moyer, J.E.	561
Jordan, J.P.	462,599,677,678,745	Musacchia, B.C.	607,731
		Musacchia, X.J.	480,481,535,564,566,607,608,688,731,732,739
Karlander, E.P.	679,680	Myhre, L.G.	682
Karney, D.H.	477,478,486,524,606		
Kase, K.	496,550	Naqvi, S.M.	609,663,664,689
Kelly, C.F.	489,634,681	Neff, S.S.	481
Kent, K.M.	595,621,715,716	Neumeyer, B.	476,526
King, G.A.	604	Newton, J.L.	545,610
Klausen, K.	682		
Knepton, J.C., Jr.	502,683		
Kok, B.	459,471,472,503,506,596,597,598,725,726,727		
Kollias, J.	599		

Oda, N.	611	Sharp, W.R.	699
Odum, E.P.	741	Shen-Miller, J.	672,699
Oemick, D.A.	662	Siegel, S.M.	546,547,548,600, 627,628,629,630,631,700, 701,717,768,769,770
Omdahl, J.L.	706	Silver, A.B.	619,764
Osretkar, A.	612	Slater, A.J.	549
Owens, O.V.H.	470,598	Slater, J.V.	447,487,488,549, 772
Oya, H.	750	Sluka, S.J.	632,655,702
Pace, N.	439,468,469,482,536,537, 538,588,589,590,674,744,765	Smith, A.H.	461,489,579,580, 582,632,633,634,681,702,748
Packer, E.	613	Smith, R.E.	594,635,657,658, 698,766,771
Paludan, C.T.	429	Smith, W.	509,660,750
Panuska, J.A.	614,691	Sobral, M.	736
Parkhurst, D.F.	690	Sondhaus, C.	450,452,454,490, 491,496,498,550,636,647,772
Paschkes, V.	490,498	Sorokin, C.	445,446,492,493, 494,495,551,552,553, 554,637,638,639,640
Patterson, G.W.	615,616	South, F.E.	675,703,737
Patterson, W.H.	617	Spencer, W.A.	646
Pengelley, E.T.	658	Spomer, G.G.	544,736
Pilmer, R.A.	563	Stapp, B.	529,530
Pitt, J.F.	773	Steward, P.G.	491,550,641,647
Polissar, M.J.	483	Swan, H.	704
Popovic, P.	618,619,691,758,759,760, 764	Swanson, C.H.	738
Popovic, V.P.	595,614,618,619,620, 621,622,623,691,692, 693,694,695,715,716, 758,759,760,761,762,763,764	Sweeny, K.	705
Prince, J.	525,527	Tagami, Y.	438
Rahlmann, D.F.	469,538,744,765	Thornton, P.A.	642,643,706
Ramkrishna, D.	696,733	Tischer, R.G.	437,463,507,508, 531,532,533,555,644,661,730
Raschke, K.	520	Tobias, C.A.	433,447,454,475, 487,488,490, 498,549, 556,557,558,604,772
Reno, V.R.	697,734	Todd, P.W.	448,557,558,559, 645,772
Renwick, G.M.	547	Tsuchiya, H.M.	431,455,464, 521,696,707,722,724,733,738
Rescigno, A.	484,485,487,624	Tu, C.L.	743
Reynolds, R.C.	477,478,486,524,525, 527,528,539,540,625,755	Turrell, E.S.	723
Rhoades, R.A.	626	Tym, R.	559
Riccio, D.C.	584,585	Valbonna, C.	646
Richards, W.P.C.	461	Van Orden, F.	479
Riopelle, A.J.	442	Vela, G.R.	561,708
Roberts, J.C.	594,635,676,698,766, 771	Viereck, E.G.	560
Robinson, S.	545,610,682,723	Vogt, F.B.	646,718
Rosenblum, E.	476,479,526,529,530	Walker, M.W.	580
Rurainski, H.J.	597,598	Wallace, R.	433,440,443,449, 450,491,496,550,617,647
Rustagi, J.S.	712,713		
Salisbury, F.B.	444,520,541,542,543, 544,659,735,736,767		
Scher, S.	613		
Schneider, E.G.	545		
Segre, G.	624		

Walter, D.O.	669
Ward, C.H.	561
Warman, N.E.	562,757
Weiss, H.S.	497,516,563,565,626, 648,649,650,652,668, 710,711,712,713,773
Welsh, R.S.	657
Westhoff, D.D.	564,608,688,731,739
Wharton, C.R.	563
Wilson, B.R.	721
Wolken, J.J.	651,709
Wright, R.A.	497,516,563,565,626, 648,649,650,652,710, 711,712,713,728,773
Wurth, M.A.	566,607
Wyard, S.J.	567
Yokoyama, K.	729
Ziobro, M.	714

# PERMUTED TITLE INDEX

abnormality in <i>Tribolium confusum</i> /Temperature dependence of wing	487
absorption and effects of radiation in the hibernator <i>Citellus tridece</i>	535
absorption following whole body irradiation in hamsters and ground squ	731
absorption in hamsters and ground squirrels, in vivo/Intestinal	732
absorption in vivo and in vitro/Effects of phlorizin on intestinal	688
absorption of sugars in the hibernator, <i>Citellus tridecemlineatus</i> /Inte	608
accelerated alpha particles/Blockage of pupillodilation with cyclotron	515
acceleration/Biological effects of chronic	634
acceleration/Persistence of adaptation to chronic	633
accelerative force/Morphological changes in avian eggs subjected to	580
accelerative forces on avian embryogenesis/Effect of	579
acceleration/Pathology of chronic	461
acceleration upon growth and body composition/Influence of chronic	489
acceleration sickness/Chronic	582
acceleration studies - physiological responses to artificial alteratio	681
accelerators: applications to space shielding/Techniques used in shie	450
Acclimatization to deep hypothermia by rats/	675
Acclimatization to deep hypothermia by rats/	703
acidity on cell division/Effects of	446
Actinomycin D and 4-nitroquinoline N-oxide/Nucleolar alterations produ	539
Actinomycin D and other metabolic inhibitors, an electron microscopic	625
Actinomycin D/Nucleolar "caps" produced by	540
activity as a measure of sensitivity to rotation in the white rat/Chan	584
adaptation in chimpanzees and squirrel monkeys in a slow rotation room	442
adaptation of rats to a high oxygen-low pressure environment/Metabolic	677
adaptation to chronic acceleration/Persistence of	633
adipose tissue of rats/Non-phosphorylating respiration of mitochondria	771
aerobic work performed during recovery from exhausting work/Effects of	723
aerobic work/The oxygen debt in	545
aerospace biology/Constitutional changes in plants grown under environ	717
age groups by fractional centrifugation/Organic synthesis in algal cel	553
age on skeletal response to immobilization and ascorbic acid deficienc	706
age/Skeletal changes with	643
Aging at the cellular level/	551
aging in algal cells/Characteristics of the process of	493
air/Depression of metabolism in animals transferred from a helium-oxyg	626
air gaseous mixtures/Metabolic and thermal responses of man during exp	747
Air vs. lowered pO <sub>2</sub> in interrupted exposure to 100% oxygen/	713
air vs. lowered pO <sub>2</sub> /Risk of mortality in interrupted exposure to 100%	712
alga <i>Anabaena flos-aquae</i> A-37/Nitrogen fixation by the blue-green	661
alga <i>Anabaena flosaquae</i> /Biosynthesis of extracellular polysaccharides	531
algae: effects on life-support systems/Extracellular polysaccharides	532
algae/Endogenous metabolism in	473
algae/Optimum conditions for photosynthesis in optimally dense culture	431
(Algae) Pure culture of <i>Anabaena flos-aquae</i> A-37/	644
(Algae) Responses of heterotrophic cultures of <i>Chlorella vulgaris</i> Beye	679
(Algae) Responses of heterotrophic cultures of <i>Chlorella vulgaris</i> Beye	680
algae/Temperature tolerance:	554
(Algae) The dependence of cell division in <i>Chlorella</i> on temperature an	640

(Algae) The effect of various nitrogen sources upon heterocyst formati	730
algal cells and its effect on cell division/Buffering activity of	552
algal cells/Characteristics of the process of aging in	493
algal gas exchanger/Optimal and dynamic characteristics of continuous	724
algal photosynthesis/Hydronechanical method to increase efficiency of	521
Allium seed, a novel capability among angiosperms/The experimental bio	770
alpha particles/Blockage of pupillodilation with cyclotron-accelerated	515
alpha particles on small mammals/Effect of high-energy protons and	636
alpine environment/Analysis of an	736
altitude/Brown fat and thermoregulation in deer mice at	594
altitude conditions/Lipid and protein metabolism in rats in oxygen und	462
altitude on maximal working capacity/Effect of high	682
altitude on oxygen consumption of deer mice: relation of temperature	676
altitude/Seasonal metabolic responses of deer mice (Peromyscus) to tem	698
ammonia-rich environments. Germination of Allium seed, a novel capabi	770
Amoeba proteus/The effects of prolonged centrifugation on	605
Anabaena flos-aquae A-37/Nitrogen fixation by the blue-green alga	661
Anabaena flos-aquae A-37/Pure culture of	644
Anabaena flos-aquae A-37/The effect of various nitrogen sources upon h	730
Anabaena flosaquae/Biosynthesis of extracellular polysaccharides by th	531
analysis/A self-contained and portable laboratory for microchemical	587
Analysis of an alpine environment/	736
Analysis of the effects of high-LET radiations on various biological t	557
Analysis of the effects of high-LET radiations on various strains of c	558
angiosperms/The experimental biology of ammonia-rich environments. Ge	770
animal/Saimiri sciureux as an experimental	501
animals/Circulation in hypothermic and hibernating	715
animals during space flight/Evaluation of cardiovascular physiology	468
animals/Factors limiting survival in hypothermic	716
animals in magnetic fields of 140,000 Oe/Survival of	500
animals in magnetic fields of 120,000 gauss/Survival of	434
animals to high-energy protons/Physical parameters in exposure of larg	550
animals to low pressure-artificial atmospheres/An improved system for	599
animals transferred from a helium-oxygen environment to air/Depression	626
animals with digital output/A thermal-gradient chamber for small	757
anoxia: different lethal effects on rye seeds/Nitrogen and helium-ind	685
anoxia on the radio-sensitivity of haploid yeast cells/Effects of glyc	475
anti-cancer drug action on normothermic tumors/Generalized hypothermia	695
aorta and right ventricle of white rats/Implantation of large polyethy	761
Apparatus for automatic dye dilution measurement of cardiac output/	439
apparatus for the microbial utilization of hydrogen produced by electr	512
apparatus of the rabbit/Radiosensitivity of the vestibular	604
aquatic ecosystems/Metabolic similarities between symbiotic coelentera	656
Arabidopsis tissue culture from seed/An improved medium for rapid init	699
Argon-helium scintillation/	440
arterial and venous catheters in laboratory primates/Chronic intravasc	744
Ascaris eggs. VI. Respiration and terminal oxidation during embryonati	660
Ascaris eggs/The comparative biochemistry and development of	750
Ascorbic acid deficiency/The influence of age on skeletal response to	706
atmosphere almost devoid of nitrogen/Incubation and hatching of chicke	497
atmosphere at reduced pressure/Prolonged exposure of young rats to an	511
atmosphere and other stress conditions: experiments with the turtle/G	629
atmosphere/Metabolism and X-ray sensitivity of chick embryos incubated	565

atmosphere of oxygen/Reaction of the chick to one	650
atmosphere oxygen/Delayed mortality in the adult chicken exposed to on	648
atmosphere/Relationship of ambient temperature to body temperature of m	667
atmosphere/The effects of changing environmental factors in embryonic	711
atmospheres/An improved system for prolonged exposure of small animals	599
atmospheres containing nitrogen oxides/Behavior of plants under extrat	546
atmospheres/Survival and growth of terrestrial microorganisms in ammon	631
ATP, NADH-dependent CO <sub>2</sub> fixation/Regulation of autotrophic and heterot	743
auxin/Action of gravity on basipetal transport of	602
Auxin transport and geoelectric potential in corn coleoptile sections/	609
Auxin transport in geotropic curvatures of a branched plant/	603
Auxin transport in leaf epinasty/	474
Auxin transport in Zea mays L. coleoptiles. I. Influence of gravity on	689
Avena seedlings/Effect of gravity compensation on the geotropic sensit	663
Avena seedlings/Role of Indole-3-acetic acid in modification of geotro	664
Avena seedlings/Simulated low-gravity environments and respiratory met	721
avian blood cells/Respiratory activity of	654
avian egg/Blastoderm location in the	655
avian eggs subjected to accelerative force/Morphological changes in	580
avian embryogenesis/Effect of accelerative forces on	579
(Bacteria) A method for the determination of low frequency transformat	714
bacteria/A relationship between growth and gravity in	479
Bacteria associated with Chlorella pyrenoidosa TX71105 in mass culture	561
bacteria by gravity and X-radiation/A comparison of the ultrastructure	530
bacteria by gravity/Ultrastructural changes produced in	476
(Bacteria) Chemosynthetic metabolism of Hydrogenomonads/	746
(Bacteria) C <sup>14</sup> O <sub>2</sub> fixation, glutamate labeling and the Krebs cycle in r	742
(Bacteria) Growth of Hydrogenomonas eutropha in urine for application	753
(Bacteria) Hydrogenomonas eutropha as a source of protein/	749
bacteria in continuous cultures/The effects of controlled environment	752
Bacterial growth as an optimal process/	738
bacteria. Molecular mechanisms of temperature adaptation/Cold sensit	754
bacteria/On the nature of mixed cultures of Chlorella pyrenoidosa TX71	708
bacteria/Phosphorylation in hydrogen	720
ballistic flights/Primate bioinstrumentation for two Jupiter	429
ballistocardiogram and electro-cardiogram in a weightless environment/	517
ballistocardiogram in a weightless environment/Triaxial	653
basipetal transport of auxin/Action of gravity on	602
bed rest on bone mass and calcium balance/The effect of	646
Behavior of plants under extraterrestrial conditions: seed germinatio	546
bicarbonate in cell division/Carbon dioxide and	445
biochemistry and development of Ascaris eggs. VI. Respiration and term	660
biochemistry and development of Ascaris eggs/The comparative	509
biochemistry and development of Ascaris eggs/The comparative	750
biochemistry and organ size of cold and heat acclimated monkeys/Studie	657
Biochemistry of brown fat and liver of hibernating golden-mantled grou	658
(Biochemistry) Oxygen-hemoglobin dissociation in Protopterus aethiopic	704
Bioelectric sensitivity to irradiation of the retina and visual pathwa	514
bioelectric transients/A recording system for measuring	438
Biological effects of magnetic fields in space travel/	456
biological systems/Interactions of radiations and other environmental	772
biology/Martian	444
Biomagnetics/	457

Biomagnetics/	577
Bioregeneration in a closed ecological system/	719
biosatellite experiments/Intestinal function and the role of hibernato	607
biosphere/Energy exchange in the	586
Biosynthesis of extracellular polysaccharides by the blue-green alga A	531
Biotelemetry of the triaxial ballistocardiogram and electrocardiogram	517
(Bird) Embryo development and chick growth in a helium-oxygen environm	649
(Bird) Metabolism and X-ray sensitivity of chick embryos incubated in	652
(Bird) Resistance of the quail, Coturnix japonica, to oxygen toxicity:	773
(Bird) The erythrocyte sedimentation test in domestic fowl/	748
(Bird) X-ray sensitivity of chick embryos incubated in helium-oxygen/	728
Blastoderm location in the avian egg/	655
blood cells/Respiratory activity of avian	654
blood lactate and pyruvate during work and recovery/Distribution of	610
blood volume changes associated with thirty days of recumbency/Tilt ta	718
blue-green alga Anabaena flos-aquae A-37/Nitrogen fixation by the	661
bone densitometry/Radiographic	686
bone mass and calcium balance/The effect of bed rest on	646
bone thickness/The effect of immobilization on skeletal metabolism in	642
braconid fecundity, fertility and life span/The combined effects of ir	673
(Bragg-Peak lithium ions) on normal rabbit skin, using integral dose a	510
(Brain) The critical temperature for intracranial self-stimulation in	764
buffer values for cell secretions/Van Slyke's	639
calcium balance/The effect of bed rest on bone mass and	646
calculus in two variables/Operational	485
canal sickness and adaptation in chimpanzees and squirrel monkeys in a	442
cannulas in the aorta and right ventricle of white rats/Implantation o	761
Carbon dioxide and bicarbonate in cell division/	445
Carbon dioxide and cell division/	637
Carbon dioxide conversion for oxygen recovery/	665
carbon dioxide method for measuring aquatic primary productivity in fr	740
carbon-energy source for the growth of Torula utilis/Palmellococcus sp	533
carcinogen 4-nitroquinoline N-oxide/Nucleolar "caps" - a morphologic e	486
carcinogenic agents/Nucleolar changes induced by ionizing radiations a	478
Cardiac excitability in high magnetic fields/	734
cardiac output/Apparatus for automatic dye dilution measurement of	439
cardiopulmonary bypass in white rats/Hypothermic	759
cardiopulmonary bypass/Retention (memory) and motor performance after	760
Cardiovascular physiology in animals during space flight/	468
Cardiovascular responses in hypothermia and hibernation/	595
Cardiovascular responses in prolonged hypothermia/	621
catecholamine contents/Effects of X-irradiation during hibernation on	480
catheterization: a technique for implanting and maintaining arterial	744
cell composition/Dynamics of microbial propagation considering inhibit	733
cell development/Photosynthesis in	638
cell division/Carbon dioxide and	637
cell division/Carbon dioxide and bicarbonate in	445
cell division/Effects of acidity on	446
cell division in Chlorella on temperature and light intensity/The depe	640
cell membranes/Ultraviolet microbeam irradiation of living	606
(Cell) Nucleolar studies/	687
cell populations/Dynamics of microbial	707
cell secretions/Van Slyke's buffer values for	639

cell studies in orbiting satellites/Biological instrumentation design	523
cells/Analysis of the effects of high-LET radiations on various strain	558
cells and its effect on cell division/Buffering activity of algal	552
cells/Characteristics of the process of aging in algal	493
cells of successive developmental stages: temperature effects/Injury	494
cells of successive developmental stages/The capacity for organic syn	492
cells/Photo-protection and human malignant	527
cells to ultraviolet radiation/The sensitivity of X-irradiated	525
Cellular and sub-cellular effects of ionizing radiations/	524
Cellular and sub-cellular responses to ultraviolet radiation/	528
cellular biochemistry and organ size of cold and heat acclimated monk	657
cellular level/Aging at the	551
centrifugation on <i>Amoeba proteus</i> /The effects of prolonged	605
centrifugation on braconid fecundity, fertility and life span/The com	673
centrifugation/Organic synthesis in algal cells separated into age gro	553
chamber for small animals with digital output/A thermal-gradient	757
Chemosynthetic gas exchanger/	504
Chemosynthetic metabolism of <i>Hydrogenomonads</i> /	746
chick embryos incubated in a helium-oxygen atmosphere/Metabolism and	565
chick embryos incubated in helium-oxygen/X-ray sensitivity of	728
chick embryos incubated in a helium-oxygen environment/Metabolism and	652
chicken eggs in an atmosphere almost devoid of nitrogen/Incubation and	497
chicken exposed to one atmosphere oxygen/Delayed mortality in the adul	648
chick growth in a helium-oxygen environment/Embryo development and	649
chick to one atmosphere of oxygen/Reaction of the	650
chick to oxygen toxicity/Resistance of the	563
chimpanzees and squirrel monkeys in a slow rotation room/Observations	442
<i>Chlorella</i> /Hydrocarbons and sterols from	615
<i>Chlorella</i> on temperature and light intensity/The dependence of cell d	640
<i>Chlorella pyrenoidosa</i> TX71105 and various bacteria/On the nature of m	708
<i>Chlorella pyrenoidosa</i> TX71105 in mass culture/Studies on bacteria ass	561
<i>Chlorella</i> /Utilization of phosphorous sources by	466
<i>Chlorella vulgaris</i> Beyerinck to darkness and light. I. Pigment and pH	679
<i>Chlorella vulgaris</i> Beyerinck to darkness and light. II. Action spectr	680
<i>Chlorella vulgaris</i> , <i>C. ellipsoidea</i> , and <i>C. saccharophila</i> /Sterols of C	616
chloroplast reactions. I. Kinetics and action spectra/Photoinhibition	725
chloroplast reactions. II. Multiple effects/Photoinhibition of	726
chloroplasts/Plastocyanin photo-oxidation by detergent-treated	597
chromosomes/The influence of vibrations on	683
<i>Chrysemys picta</i> /Renewal of intestinal epithelium in fresh water turtl	566
Circulation in hypothermic and hibernating animals/	715
circulation in hypothermic rats/Extracorporeal	758
circulatory function at null gravity/Evaluation of	482
( <i>Citellus lateralis</i> ) Biochemistry of brown fat and liver of hibernati	658
<i>Citellus tridecemlineatus</i> /Active absorption of D-glucose by intestina	481
<i>Citellus tridecemlineatus</i> /Active transport of D-galactose and concomi	739
<i>Citellus tridecemlineatus</i> /Intestinal absorption and effects of radiat	535
<i>Citellus tridecemlineatus</i> /Intestinal absorption of sugar and effects	564
<i>Citellus tridecemlineatus</i> /Intestinal absorption of sugars in the hibe	608
citrate and lactate by <i>Pseudomonas aeruginosa</i> and <i>Serratia indica</i> /Oxi	508
<i>Cladonia rangiferina</i> to environmental stress factors: temperature, r	628
clinostat rotated <i>Avena</i> seedlings/Role of Indole-3-acetic acid in mod	664
closed-cycle space systems/A continuous culture apparatus for the mic	512
closed ecological system/Bioregeneration in a	719



closed ecological system during microbial synthesis/Quantitative meas	463
coelenterates and aquatic ecosystems/Metabolic similarities between s	656
Cold sensitive mutants at a minimum temperature of growth of bacteria	754
coleoptile sections/Auxin transport and geoelectric potential in corn	609
coleoptiles. I. Influence of gravity on the transport of indoleacetic	689
cold and heat acclimated monkeys/Studies on the cellular biochemistry	657
cold-exposed rats/Time dependent responses of brown fat in	635
comparative biochemistry and development of Ascaris eggs/The	509
comparative biochemistry and development of Ascaris eggs/The	750
comparative biochemistry and development of Ascaris eggs. VI. Respira	660
comparative biology of experimental atmosphere and other stress condi	629
computations of depth dose in tissue irradiated by protons/Results of	641
C <sup>14</sup> O <sub>2</sub> fixation, glutamate labeling and the Krebs cycle in ribose-grow	742
contactor/Mass transfer characteristics of a Venturi liquid-gas	455
controlled-environment unit/A special-purpose	543
Convection in low gravitational fields/	483
convection, radiation and transpiration/The microenvironment of broad	684
conversion for oxygen recovery/Carbon dioxide	665
cooling/Regression of normothermic tumors after generalized body	763
corn coleoptile sections/Auxin transport and geoelectric potential in	609
(Corn) Auxin transport in Zea mays L. Coleoptiles. I. Influence of gr	689
Co <sup>60</sup> irradiation in ground squirrel, Citellus tridecemlineatus/Intest	564
Coturnix japonica, to oxygen toxicity: role of food intake/Resistanc	773
CO <sub>2</sub> fixation in Hydrogenomonas facilis. Ribulosediphosphate carboxyla	743
Critical temperature for instrumental response acquisition in hypothe	614
culture apparatus for the microbial utilization of hydrogen produced	512
culture from seed/An improved medium for rapid initiation of Arabidop	699
culture of a microorganism similar to the Precambrian microfossil Kak	700
culture of Anabaena flos-aquae A-37/Pure	644
culture/Studies on bacteria associated with Chlorella pyrenoidosa TX7	561
cultures of algae/Optimum conditions for photosynthesis in optimally	431
cultures of Chlorella pyrenoidosa TX71105 and various bacteria/On the	708
cultures of Chlorella vulgaris Beyerinck to darkness and light. I. Pi	679
cultures of Chlorella vulgaris Beyerinck to darkness and light. II. A	680
cultures/The effects of controlled environment on the growth of Hydro	752
cyclotron-accelerated alpha particles/Blockage of pupillodilation wit	515
cytophotometric method for study of the erythroid development sequenc	452
cytoplasmic alterations produced by Actinomycin D and other metabolic	625
darkness and light. I. Pigment and pH changes/Responses of heterotrop	679
darkness and light. II. Action spectrum for and mechanism of the ligh	680
deer mice at altitude/Brown fat and thermoregulation in	594
deer mice (Peromyscus) to temperature and altitude/Seasonal metabolic	698
deer mice: relation of temperature and season/Effect of altitude on	676
deficiency/The influence of age on skeletal response to immobilizatio	706
densitometry/Radiographic bone	686
density distribution/Orientation in systems with asymmetric	702
designs for living human cell studies in orbiting satellites/Biologic	523
deuterium oxide/Germination and seedling growth of winter rye in	548
development and chick growth in a helium-oxygen environment/Embryo	649
development, and metabolism of plants/The influence of simulated low	751
development: bases for experiment/Gravity and plant	467

development by the use of elevated temperatures/Modification of radiati	488
development in a He-O <sub>2</sub> atmosphere/The effects of changing environmental	711
development of Ascaris eggs. VI. Respiration and terminal oxidation dur	660
development of Ascaris eggs/The comparative biochemistry and	509
development of Ascaris eggs/The comparative biochemistry and	750
development of temperature regulation in the tundra vole, Microtus oeco	560
development of tumors/Effect of hypothermia on growth and	620
development/Photosynthesis in cell	638
development sequence in mammals/A cytophotometric method for study of t	452
developmental stages/The capacity for organic synthesis in cells of suc	492
D-galactose and concomitant metabolic acitivity of small intestine of th	739
D-glucose by intestinal segments of the ground squirrel (Citellus tride	481
digital output/A thermal-gradient chamber for small animals with	757
dose as a basis for comparison/Relative efficiency of high-LET radiatio	510
dose from ( $\alpha$ ,h) and ( $\gamma$ ,h) sources in a tissue-equivalent/Neutron dept	451
dose in tissue irradiated by protons/Results of computations of depth	641
dose rate dependence and RBE of 730-MeV protons, 100 kVp X-rays and 250	498
dose rates in spheres and slabs of tissue/Primary and secondary - proto	647
Drosophila melanogaster in magnetic fields/Experiments with	436
drug action on normothermic tumors/Generalized hypothermia enhances ant	695
drugs on normothermic tumors of hypothermic hamsters/Effects of anti-ca	762
dynamic characteristics of a continuous photosynthetic algal gas exchan	724
dynamics/A model for microbial population statistics and	722
Dynamics of microbial cell populations/	707
Dynamics of microbial growth. A distributed structured model/	696
Dynamics of microbial propagation considering inhibitors and variable c	733
ecological system, with special reference to succession and stability/T	741
ecosystems/Metabolic similarities between symbiotic coelenterates and a	656
effect and geotropic curvature/Geoelectric	583
Effect of accelerative forces on avian embryogenesis/	579
Effect of altitude on oxygen consumption of deer mice: relation of tem	676
effect of bed rest on bone mass and calcium balance/The	646
effect of discontinuous exposure of rats to a high oxygen-low pressure	678
Effect of generalized hypothermia on normothermic tumors/	693
Effect of gravity compensation on the geotropic sensitivity of Avena se	663
Effect of high altitude on maximal working capacity/	682
Effect of high-energy protons and alpha particles on small mammals/	636
Effect of hypothermia on growth and development of tumors/	620
effect of immobilization on skeletal metabolism in guinea pigs with var	642
effect of short periods of air breathing on oxygen toxicity in mice/The	516
Effect of the irradiation temperature on the production of free radical	591
effect of various nitrogen sources upon heterocyst formation in Anabaen	730
effect of X-rays and heavy ions/The sensitization by iododeoxyuridine o	559
Effects of acidity on cell division/	446
Effects of aerobic work performed during recovery from exhausting work/	723
Effects of anti-cancer drugs on normothermic tumors of hypothermic hams	762
effects of changing environmental factors in embryonic development in a	711
effects of chronic acceleration/Biological	634
effects of controlled environment on the growth of Hydrogenomonas bacte	752
effects of Co <sup>60</sup> irradiation in ground squirrel, Citellus tridecemlineat	564
effects of environmental temperature changes on the EKG of the squirrel	585
Effects of glycerol and of anoxia on the radio-sensitivity of haploid y	475

effects of heavy charged particle irradiations/Acute cellular	601
effects of heavy ions/Biological	645
effects of high-LET radiations on various biological test objects/Analy	557
effects of high-LET radiations on various strains of cells/Analysis of	558
effects of ionizing radiations/Cellular and sub-cellular	524
effects of irradiation, vibration, and centrifugation on braconid fecun	673
Effects of lipids on haematopoietic organs of X-irradiated male mice/	441
Effects of magnetic fields in their relation to space travel/	499
Effects of oxidants and ionizing conditions on seed germination at suba	627
Effects of oxygen pressure and salts on germination of winter rye/Exper	630
Effects of phlorizin on intestinal absorption in vivo and in vitro/	688
effects of prolonged centrifugation on Amoeba proteus/The	605
effects of radiation in the hibernator Citellus tridecemlineatus/Intest	535
Effects of ultraviolet radiation on the leaves of higher plants/	659
effects of very low and very high fields/Experimental	578
effects of weightlessness on mammals/The	536
Effects of X-irradiation during hibernation on tissue catecholamine con	480
effects of X-radiation/Sub-cellular	477
effects on life-support systems/Extracellular polysaccharides of algae:	532
effects on rye seeds/Nitrogen and helium-induced anoxia: different let	685
effects/Photoinhibition of chloroplast reactions. II. Multiple	726
effects with magnetic fields/Modification of radiation	453
egg/Blastoderm location in the avian	655
egg shell strength/A hydrostatic pressure tester of	632
eggs. VI. Respiration and terminal oxidation during embryonation/The co	660
eggs in an atmosphere almost devoid of nitrogen/Incubation and hatching	497
eggs subjected to accelerative force/Morphological changes in avian	580
eggs/The comparative biochemistry and development of Ascaris	750
electro-cardiogram in a weightless environment/Biotelemetry of the tria	517
electrocardiogram of squirrel monkeys/Influence of strong magnetic fiel	502
electrolysis of water in closed-cycle space systems/A continuous cultur	512
electromagnetic energy/Neurological responses to external	458
electron distribution for heavy ions/Secondary	611
electron microscopic and time-lapse study/Nucleolar and cytoplasmic alt	625
electron paramagnetic resonance signal in photosynthetic materials/An a	503
electrons and heavy ions/Free radical induced in enzymes by	592
electrons and protons /Particulate radiation:	433
Embryo development and chick growth in a helium-oxygen environment/	649
embryogenesis/Effect of accelerative forces on avian	579
embryonation/The comparative biochemistry and development of Ascaris eg	660
embryonic development by the use of elevated temperatures/Modification	488
embryonic development in a He-O <sub>2</sub> atmosphere/The effects of changing env	711
embryonic sites in Tribolium/Heavy ion localization of sensitive	549
embryos incubated in a helium-oxygen atmosphere/Metabolism and X-ray se	565
embryos incubated in a helium-oxygen environment/Metabolism and X-ray s	652
embryos incubated in helium-oxygen/X-ray sensitivity of chick	728
energy budget of Populus sargentii leaves/Transpiration resistance and	690
energy environment of the alpine tundra/The	671
Energy exchange in the biosphere/	586
Energy metabolism in hibernation/	737
energy transfer/Photoreceptor structures and	651
environmental factors in embryonic development in a He-O <sub>2</sub> atmosphere/Th	711
environmental stress and their implications for aerospace biology/Const	717
environmental stress factors: temperature, radiation and water/Respons	628

environmental stresses in biological systems/Interactions of radiations	772
environmental temperature changes on the EKG of the squirrel monkey (Sai	585
environment/Analysis of an alpine	736
environment/Biotelemetry of the triaxial ballistocardiogram and electroc	517
environment/Embryo development and chick growth in a helium-oxygen	649
environment/Metabolic adaptation of rats to a high oxygen-low pressure	677
environment/Metabolic changes in rats exposed to an oxygen-enriched	745
environment/Metabolism and X-ray sensitivity of chick embryos incubated	652
environment of the alpine tundra/The energy	671
environment on the growth of Hydrogenomonas bacteria in continuous cult	752
environments and respiratory metabolism in Avena seedlings/Simulated lo	721
environments. Germination of Allium seed, a novel capability among ang	770
environments/Leaf temperatures in controlled	520
environments on growth, development, and metabolism of plants/The influ	751
environments/Geotropism in simulated low-gravity	662
environment/The effect of discontinuous exposure of rats to a high oxyg	678
environment/Thermal responses of man during rest and exercise in a heli	668
environment to air/Depression of metabolism in animals transferred from	626
environment/Triaxial ballistocardiogram in a weightless	653
environment unit/A special-purpose controlled	543
(Enzyme) Regulation of autotrophic and heterotrophic CO <sub>2</sub> fixation in Hy	743
enzymes by electrons and heavy ions/Free radical induced in	592
epinasty/Auxin transport in leaf	474
epithelium in fresh water turtle/Renewal of intestinal	566
EPR signal and pigment P700/Relationship between light induced	459
equipment for physiological studies on the pig-tailed monkey (Macaca ne	538
erythrocyte sedimentation test in domestic fowl/The	748
erythroid development sequence in mammals/A cytophotometric method for	452
E. coli B by gravity/Ultrastructural alterations induced in	526
Escherichia coli by repeated freezing and thawing/Factors affecting the	613
euthermic tumors after 10-hour generalized hypothermia/Disappearance of	622
euthermic tumors (37°C) in shallow hypothermia/Disappearance of	623
evolution step in photosynthesis/Kinetics and intermediates of the oxyg	727
exchanger/Chemosynthetic gas	504
exchanger/Optimal and dynamic characteristics of a continuous photosynt	724
exercise in a helium-oxygen environment/Thermal responses of man during	668
Exobiology/	541
(Exobiology) Mars as a habitat for life/	767
(Exobiology) Terrestrial models of Martian life/	769
(Exobiology) The possibilities of life on Mars/	735
experimental animal/Saimiri sciureus as an	501
experimental approach to the basic biology of stress/Elements of space	768
experimental biology of ammonia-rich environments. Germination of All	770
Experimental effects of very low and very high fields/	578
experiments/Intestinal function and the role of hibernators in biosatel	607
Experiments with Drosophila melanogaster in magnetic fields/	436
experiments with the turtle, Pseudemys scripta-elegans/General and comp	629
extracellular polysaccharide produced by Palmella mucosa Kutz/An	555
extracellular polysaccharides by the blue-green alga Anabaena flosaquae	531
Extracellular polysaccharides of algae: effects on life-support system	532
extracellular products of Hydrogenomonas eutropha/Preliminary studies o	507
extraterrestrial conditions: seed germination in atmospheres containin	546
fat and liver of hibernating golden-mantled ground squirrels (Citellus	658

fat and thermoregulation in deer mice at altitude/Brown	594
fat in cold-exposed rats/Time dependent responses of brown	635
fat in cold-exposed rats/Time dependent responses of brown	766
fecundity, fertility and life span/The combined effects of irradiation, v	673
fertility and life span/The combined effects of irradiation, vibration, a	673
Fertility studies of X-irradiated male mice/	432
fields/Modification of radiation effects with magnetic	453
(Fish) Oxygen-hemoglobin dissociation in <i>Protopterus aethiopicus</i>	704
5-fluorocil action on normothermic tumors in generalized hypothermia/Enha	694
Fluorescence studies/	471
food intake/Resistance of the quail, <i>Coturnix japonica</i> , to oxygen toxicit	773
4-nitroquinoline N-oxide/Nucleolar alterations produced by Actinomycin D	539
4-nitroquinoline N-oxide/Nucleolar "caps" - a morphologic entity produced	496
fowl/The erythrocyte sedimentation test in domestic	748
freezing and thawing/Factors affecting the rate of killings of <i>Escherichi</i>	613
frequency transformations with <i>Hydrogenomonas facilis</i> /A method for the de	714
function and the role of hibernators in biosatellite experiments/Intestin	607
function at null gravity/Evaluation of circulatory	482
gases/Differential losses of seed viability conditioned by chemically ine	600
gas exchanger/Chemosynthetic	504
gas exchanger/Optimal and dynamic characteristics of a continuous photosy	724
(Genetics) The influence of vibrations on chromosomes/	683
Geoelectric effect and geotropic curvature/	583
geoelectric potential in corn coleoptile sections/Auxin transport and	609
geotropic curvature/Geoelectric effect and	583
geotropic curvatures of a branched plant/Auxin transport in	603
geotropic responses in clinostat rotated <i>Avena</i> seedlings/Role of indole-3	664
geotropic sensitivity of <i>Avena</i> seedlings/Effect of gravity compensation o	663
Geotropism in simulated low-gravity environments/	662
germ-free rats and mice exposed to 100% oxygen/Mortality and histopatholo	710
Germination and seedling growth of winter rye in deuterium oxide/	548
germination at subatmospheric oxygen levels/Effects of oxidants and ioniz	627
germination of <i>Allium</i> seed, a novel capability among angiosperms/The expe	770
germination of winter rye/Experimentation with plants at sub-atmospheric	630
Glucose intestinal transport and absorption following whole body irradiat	731
glutamate labeling and the Krebs cycle in ribose-grown <i>Hydrogenomonas fac</i>	742
glycerol and of anoxia on the radio-sensitivity of haploid yeast cells to	475
gradient chamber for small animals with digital output/A thermal-	757
gravitational fields/Convection in low	483
gravitational force perception by plants/On the thresholds of	672
Gravity and plant development: bases for experiment/	467
gravity and X-radiation/A comparison of the ultrastructural changes produ	530
gravity compensation on the geotropic sensitivity of <i>Avena</i> seedlings/Effe	663
gravity environments on growth, development, and metabolism of plants/The	751
gravity in bacteria/A relationship between growth and	479
gravity on basipetal transport of auxin/Action of	602
gravity on the transport of indoleacetic acid 2- <sup>14</sup> C/Auxin transport in <i>Ze</i>	689
gravity/Orientation of wheat seedling organs in relation to	729
Gravity, radiation and growth/	529
gravity/Ultrastructural changes produced in bacteria by	476
ground squirrels ( <i>Citellus lateralis</i> )/Biochemistry of brown fat and liver	658
ground-squirrel ( <i>Citellus tridecemlineatus</i> )/Active absorption of D-glucos	481
ground squirrel, <i>Citellus tridecemlineatus</i> /Intestinal absorption of sugar	564

ground squirrels/Glucose intestinal transport and absorption following	731
ground squirrels, in vivo/Intestinal absorption in hamsters and	732
growth. A distributed structured model/Dynamics of microbial	696
growth and body composition/Influence of chronic acceleration upon	489
growth and development of tumors/Effect of hypothermia on	620
growth and gravity in bacteria/A relationship between	479
Growth and metabolism of <i>Chlorella pyrenoidosa</i> Chick during substitutio	612
growth as an optimal process/Bacterial	738
growth, development, and metabolism of plants/The influence of simulate	751
growth/Gravity, radiation and	529
growth in a helium-oxygen environment/Embryo development and chick	649
growth of bacteria. Molecular mechanisms of temperature adaptation/Col	754
growth of <i>Hydrogenomonas</i> bacteria in continuous cultures/The effects of	752
Growth of <i>Hydrogenomonas eutropha</i> in urine for application to a biorege	753
growth of plants submerged in fresh and saline waters/Micro-aerobic cap	701
growth of terrestrial microorganisms in ammonia-rich atmospheres/Surviva	631
growth of <i>Torula utilis</i> /Palmellococcus species as a carbon-energy sourc	533
growth of winter rye in deuterium oxide/Germination and seedling	548
Growth rate and the development of temperature regulation in the tundra	560
growth/Responses of heterotrophic cultures of <i>Chlorella vulgaris</i> Beyer	680
guinea pigs with varying bone thickness/The effect of immobilization on	642
haematopoietic organs of X-irradiated male mice/Effects of lipids on	441
halophiles from Owens Lake/Photosynthetic	705
hamsters and ground squirrels/Glucose intestinal transport and absorpti	731
hamsters and ground squirrels, in vivo/Intestinal absorption in	732
hamsters/Effects of anti-cancer drugs on normothermic tumors of hypothe	762
Handling procedures and equipment for physiological studies on the pig-	538
hatching of chicken eggs in an atmosphere almost devoid of nitrogen/Inc	497
heat acclimated monkeys/Studies on the cellular biochemistry and organ	657
helium-induced anoxia: different lethal effects on rye seeds/Nitrogen	685
helium-oxygen atmosphere/Metabolism and X-ray sensitivity of chick embr	565
helium-oxygen environment/Embryo development and chick growth in a	649
helium-oxygen environment/Metabolism and X-ray sensitivity of chick emb	652
helium-oxygen environment/Thermal responses of man during rest and exer	668
helium-oxygen environment to air/Depression of metabolism in animals tr	626
helium-oxygen/X-ray sensitivity of chick embryos incubated in	728
helium scintillation/Argon-	440
Hematology of the pig-tailed monkey, <i>Macaca nemestrina</i> /	765
hemoglobin dissociation in <i>Protopterus aethiopicus</i> /Oxygen-	704
He-O <sub>2</sub> and air gaseous mixtures/Metabolic and thermal responses of man d	747
He-O <sub>2</sub> atmosphere/Relationship of ambient temperature to body temperatur	667
He-O <sub>2</sub> atmosphere/The effects of changing environmental factors in embryo	711
heterocyst formation in <i>Anabaena flos-aquae</i> A-37/The effect of various	730
heterotrophic cultures of <i>Chlorella vulgaris</i> Beyerinck to darkness and	679
heterotrophic cultures of <i>Chlorella vulgaris</i> Beyerinck to darkness and	680
hibernating animals/Circulation in hypothermic and	715
hibernating golden-mantled ground squirrels ( <i>Citellus lateralis</i> )/Bioche	658
hibernation/Cardiovascular responses in hypothermia and	595
hibernation/Energy metabolism in	737
hibernation on tissue catecholamine contents/Effects of X-irradiation d	480
hibernator <i>Citellus tridecemlineatus</i> /Active transport of D-galactose an	739
hibernator <i>Citellus tridecemlineatus</i> /Intestinal absorption and effects	535
hibernator, <i>Citellus tridecemlineatus</i> /Intestinal absorption of sugars i	608

hibernators in biosatellite experiments/Intestinal function and the role of	607
high-energy particulate radiation/Studies on the mammalian radiation sensitivity	454
high-LET radiation (Bragg-Peak lithium ions) on normal rabbit skin, using	510
high-LET radiations on various biological test objects/Analysis of the effects	557
high-LET radiations on various strains of cells/Analysis of the effects of	558
Histopathologic evaluation of a laboratory primate: the squirrel monkey	513
histopathology of germ-free rats and mice exposed to 100% oxygen/Mortality	710
human cells to the lethal effect of X-rays and heavy ions/The sensitization	559
human cell studies in orbiting satellites/Biological and instrumentation	523
human malignant cells/Photo-protection and	527
Hydrocarbons and sterols from Chlorella/	615
hydrogen bacteria/Phosphorylation in	720
Hydrogenomonas bacteria in continuous cultures/The effects of controlled	752
Hydrogenomonads/Chemosynthetic metabolism of	746
Hydrogenomonas eutropha as a source of protein/	749
Hydrogenomonas eutropha in urine for application to a bioregenerative life	753
Hydrogenomonas eutropha/Preliminary studies on the extracellular products	507
Hydrogenomonas facilis/A method for the determination of low frequency	714
Hydrogenomonas facilis/ $C^{14}O_2$ fixation, glutamate labeling and the Krebs	742
Hydrogenomonas facilis. Ribulosediphosphate carboxylase, phosphoribulose	743
hydrogen produced by electrolysis of water in closed-cycle space system	512
Hydromechanical method to increase efficiency of algal photosynthesis/	521
hypothermia by rats/Acclimatization to deep	703
hypothermia by rats/Acclimatization to deep	675
hypothermia/Cardiovascular responses in prolonged	621
hypothermia/Disappearance of euthermic tumors after 10-hour generalized	622
hypothermia/Disappearance of euthermic tumors (37°C) in shallow	623
hypothermia and hibernation/Cardiovascular responses in	595
hypothermia/Enhancement of 5-fluorouracil action on normothermic tumors in	694
hypothermia enhances anti-cancer drug action on normothermic tumors/General	695
hypothermia/Instrumental acquisition in rats after twelve exposures to	691
hypothermia on growth and development of tumors/Effect of	620
hypothermia on normothermic tumors/Effect of generalized	693
hypothermic and hibernating animals/Circulation in	715
hypothermic animals/Factors limiting survival in	716
Hypothermic cardiopulmonary bypass in white rats/	759
hypothermic cardiopulmonary bypass/Retention (memory) and motor performance	760
hypothermic rats/Critical temperature for instrumental response acquisition	614
hypothermic rats/Extracorporeal circulation in	758
immobilization and ascorbic acid deficiency/The influence of age on skeletal	706
immobilization on skeletal metabolism in guinea pigs with varying bone	642
(Immobilization) Tilt table response and blood volume changes associated	718
Implantation of large polyethylene cannulas in the aorta and right ventricle	761
implanting and maintaining arterial and venous catheters in laboratory	744
Incubation and hatching of chicken eggs in an atmosphere almost devoid of	497
indoleacetic acid $2-^{14}C$ /Auxin transport in Zea mays L. coleoptiles. I.	689
indole-3-acetic acid in modification of geotropic responses in clinostaxis	664
inert gases/Differential losses of seed viability conditioned by chemical	600
inhibitors and variable cell composition/Dynamics of microbial propagation	733
inhibitors, an electron microscopic and time-lapse study/Nucleolar and	625
injury mode, dose-rate dependence and RBE of 730-MeV protons, 100 kVp X	498
(Insect) The combined effects of irradiation, vibration, and centrifugation	673
Instrumental acquisition in rats after twelve exposures to deep hypothermia	691

instrumentation designs for living human cell studies in orbiting satel	523
instrumentation for two Jupiter ballistic flights/Primate bio-	429
intensity profile of a high-energy-proton beam after scattering in a th	496
Intestinal absorption and effects of radiation in the hibernator Citell	535
Intestinal absorption in hamsters and ground squirrels, in vivo/	732
intestinal absorption in vivo and in vitro/Effects of phlorizin on	688
Intestinal absorption of sugars in the hibernator, Citellus tridecemlin	608
Intestinal absorption of sugar and effects of Co <sup>60</sup> irradiation in groun	564
intestinal epithelium in fresh water turtle, Chrysemys picta/Renewal of	566
Intestinal function and the role of hibernators in biosatellite experim	607
intestinal transport and absorption following whole body irradiation in	731
intestine of the hibernator Citellus tridecemlineatus/Active transport	739
in vitro/Effects of phlorizin on intestinal absorption in vivo and	688
in vivo and in vitro/Effects of phlorizin on intestinal absorption	688
in vivo/Intestinal absorption in hamsters and ground squirrels,	732
iododeoxyuridine of cultured human cells to the lethal effect of X-rays	559
ion localization of sensitive embryonic sites in Tribolium/Heavy	549
ions/Biological effects of heavy	645
ions/Free radical induced in enzymes by electrons and heavy	592
ions/Production of free radicals in solid biological substances by heav	593
ions/Secondary electron distribution for heavy	611
ions/The sensitization by iododeoxyuridine of cultured human cells to t	559
irradiation in ground squirrel, Citellus tridecemlineatus/Intestinal ab	564
irradiation in hamsters and ground squirrels/Glucose intestinal transpo	731
irradiation/Nucleolar "caps" induced by flying spot ultraviolet nuclear	755
irradiation of living cell membranes/Ultraviolet microbeam	606
irradiation of the retina and visual pathways/Bioelectric sensitivity t	514
irradiation omnidirectionally with high-energy protons/Depth dose in la	491
irradiation/On the spatial distribution of radicals produced by	567
irradiation/Progress report on pituitary	556
irradiations/Acute cellular effects of heavy charged particle	601
irradiation temperature on the production of free radicals in solid bio	591
irradiation, vibration, and centrifugation on braconid fecundity, ferti	673
Jupiter ballistic flights/Primate bio-instrumentation for two	429
Kakabekia umbellata Barghoorn in NH <sub>3</sub> -rich atmospheres/On the culture of	700
Kinetics and action spectra/Photoinhibition of chloroplast reactions.	725
Kinetics and intermediates of the oxygen evolution step in photosynthes	727
Krebs cycle in ribose-grown Hydrogenomonas facilis/C <sup>14</sup> O <sub>2</sub> fixation, glut	742
laboratory for microchemical analysis/A self-contained and portable	587
laboratory primate: the squirrel monkey (Saimiri sciureus)/Histopathol	513
lactate and pyruvate during work and recovery/Distribution of blood	610
lactate by Pseudomonas aeruginosa and Serratia indica/Oxidative metabol	508
leaf epinasty/Auxin transport in	474
Leaf temperature in controlled environments/	520
Leaf temperatures of alpine plants in the field/	544
leaves/Transpiration resistance and energy budget of Populus sargentii	690
lethal effects on rye seeds/Nitrogen and helium-induced anoxia: differ	685
lethality in diploid Saccharomyces cerevisiae, in relation to ionizatio	534
life in space - a new approach/Sustaining	505



life/Mars as a habitat for	767
life on Mars/The possibilities of	735
life span/The combined effects of irradiation, vibration, and centrifug	673
Life support systems and outer space/	666
life-support systems/Extracellular polysaccharides of algae: effects o	532
Life support systems for space missions/	506
life support systems/Growth of <i>Hydrogenomonas eutropha</i> in urine for app	753
life/Terrestrial models of Martian	769
light. I. Pigment and pH changes/Responses of heterotrophic cultures of	679
light. II. Action spectrum for and mechanism of the light requirement f	680
light-induced electron paramagnetic resonance signal in photosynthetic	503
light induced EPR signal and pigment P700/Relationship between	459
light intensity/The dependence of cell division in <i>Chlorella</i> on tempera	640
light reactions in photosynthesis/Two	518
Lipid and protein metabolism in rats in oxygen under simulated high alt	462
Lipids and the molecular structure of photoreceptors/	709
lipids on haematopoietic organs of X-irradiated male mice/Effects of	441
liver of hibernating golden-mantled ground squirrels ( <i>Citellus laterali</i>	658
location in the avian egg/Blastoderm	655
losses of seed viability conditioned by chemically inert gases/Differen	600
low-gravity environments and respiratory metabolism in <i>Avena</i> seedlings/	721
low-gravity environments/Geotropism in simulated	662
<i>Macaca nemestrina</i> /Handling procedures and equipment for physiological s	538
<i>Macaca nemestrina</i> /Hematology of the pig-tailed monkey	765
<i>Macaca nemestrina</i> /Preliminary observations of some physiological charac	537
magnetic fields/Cardiac excitability in high	734
magnetic fields/Experiments with <i>Drosophila melanogaster</i> in	436
magnetic fields/Exposure of man to low intensity	435
magnetic fields in space travel/Biological effects of	456
magnetic fields in their relation to space travel/Biological effects of	499
magnetic fields of 140,000 Oe/Survival of animals in	500
magnetic fields of 120,000 gauss/Survival of animals in	434
magnetic fields on the electrocardiogram of squirrel monkeys/Influence	502
magnetic fields/Sea urchin mitosis in high	697
mammalian radiation syndrome with high-energy particulate radiation/Stu	454
mammalian radiation syndrome with high-energy particulate radiation/Stu	490
mammals/A cytophotometric method for study of the erythroid development	452
mammals/Effect of high-energy protons and alpha particles on small	636
mammals/The effects of weightlessness on	536
man during exposure to He-O <sub>2</sub> and air gaseous mixtures/Metabolic and the	747
man during rest and exercise in a helium-oxygen environment/Thermal res	668
man in a He-O <sub>2</sub> atmosphere/Relationship of ambient temperature to body t	667
man in space/Question of sustaining	460
man to low intensity magnetic field/Exposure of	435
Mars as a habitat for life/	767
Mars - paradox/	542
Mars/The possibilities of life on	735
Martian biology/	444
Martian life/Terrestrial models of	769
Mass transfer characteristics of a Venturi liquid-gas contactor/	455
measurement of cardiac output/Apparatus for automatic dye dilution	439
Measurement of urinary nitrogen and total solids depletion in a closed	463
measure of sensitivity to rotation in the white rat/Changes in spontane	584

measuring aquatic primary productivity in fresh water/A pH-carbon dioxi	740
medium for rapid initiation of Arabidopsis tissue culture from seed/An	699
membranes/Ultraviolet microbeam irradiation of living cell	606
(Memory) and motor performance after hypothermic cardiopulmonary bypass	760
meson factory/Shielding and activation considerations for a	443
metabolic activity of small intestine of the hibernator Citellus tridec	739
Metabolic adaptation of rats to a high oxygen-low pressure environment/	677
Metabolic and thermal responses of man during exposure to He-O <sub>2</sub> and air	747
Metabolic changes in rats exposed to an oxygen-enriched environment/	745
metabolic inhibitors, an electron microscopic and time-lapse study/Nucl	625
metabolic responses of deer mice (Peromyscus) to temperature and altitu	698
Metabolic similarities between symbiotic coelenterates and aquatic ecos	656
Metabolism and X-ray sensitivity of chick embryos incubated in a helium	565
Metabolism and X-ray sensitivity of chick embryos incubated in a helium	652
metabolism in algae/Endogenous	473
metabolism in animals transferred from a helium-oxygen environment to a	626
metabolism in Avena seedlings/Simulated low-gravity environments and re	721
metabolism in guinea pigs with varying bone thickness/The effect of imm	642
metabolism in hibernation/Energy	737
metabolism in rats in oxygen under simulated high altitude conditions/L	462
metabolism of Chlorella pyrenoidosa Chick during substitution of Rb for	612
metabolism of citrate and lactate by Pseudomonas aeruginosa and Serrat	508
metabolism of Hydrogenomonads/Chemosynthetic	746
metabolism of plants/The influence of simulated low gravity environment	751
method for measuring aquatic primary productivity in fresh water/A pH-c	740
method for study of the erythroid development sequence in mammals/A cyt	452
method for the determination of low frequency transformations with Hydr	714
method to increase efficiency of algal photosynthesis/Hydromechanical	521
metric properties of the systems of compartments/On some	624
mice/Effects of lipids on haematopoietic organs of X-irradiated male	441
mice/Fertility studies of X-irradiated male	432
mice/The effect of short periods of air breathing on oxygen toxicity in	516
Micro-aerobic capabilities in land plants: observations on survival an	701
microbial cell populations/Dynamics of	707
microbial growth. A distributed structured model/Dynamics of	696
microbial population statistics and dynamics/A model for	722
microbial propagation considering inhibitors and variable cell composi	733
Microbial synthesis of animal feeds from human waste substrates/	437
microbial synthesis/Quantitative measurement of urinary nitrogen and to	463
microbial utilization of hydrogen produced by electrolysis of water in	512
microchemical analysis/A self-contained and portable laboratory for	587
Microchemical urinalysis. I. Simplified determinations of ammonia, urea	588
Microchemical urinalysis. II. Microturbidimetric determination of sulfa	589
Microchemical urinalysis. III. A simple automatic recording time-flow t	590
micro-environment of broad leaf plants - convection, radiation, and tra	684
microfossil Kakabekia umbellata Barghoorn in NH <sub>3</sub> -rich atmospheres/On th	700
microorganism similar to the Precambrian microfossil Kakabekia umbellat	700
microorganisms/Continuous propagation of	464
microorganisms in ammonia-rich atmospheres/Survival and growth of terres	631
microscopy/Flying and stepping spot television	522
microtines/Temperature selection in Alaskan	756
microturbidimetric determination of sulfate/Microchemical urinalysis. I	589
Microtus oecomomus/Growth rate and the development of temperature regul	560

missions/Life support systems for space	506
mitochondria from brown adipose tissue of rats/Non-phosphorylating resp	771
mitosis in high magnetic fields/Sea urchin	697
model/Dynamics of microbial growth. A distributed structured	696
model for microbial population statistics and dynamics/A	722
models of Martian life/Terrestrial	769
monkey ( <i>Macaca nemestrina</i> )/Handling procedures and equipment for physio	538
monkey, <i>Macaca nemestrina</i> /Hematology of the pig-tailed	765
monkey, <i>Macaca nemestrina</i> /Preliminary observations of some physiologica	537
monkeys/Studies on the cellular biochemistry and organ size of cold and	657
Morphological changes in avian eggs subjected to accelerative force/	580
morphologic entity produced by the carcinogen 4-nitroquinoline N-oxide/	486
Mortality and histology of germ-free rats and mice exposed to 100% oxyg	710
mortality in interrupted exposure to 100% oxygen: role of air vs. lowe	712
mutants at a minimum temperature of growth of bacteria. Molecular mecha	754
mutations and lethality in diploid <i>Saccharomyces cerevisiae</i> , in relatio	534
NADH-dependent CO <sub>2</sub> fixation/Regulation of autotrophic and heterotrophic	743
Neurological responses to external electromagnetic energy/	458
Neutron depth dose from ( $\alpha$ ) and ( $\gamma$ ) sources in a tissue-equivalent/	451
Nitrogen and helium-induced anoxia: different lethal effects of rye se	685
nitrogen and total solids depletion in a closed ecological system durin	463
Nitrogen fixation by the blue-green alga <i>Anabaena flos-aquae</i> A-37/	661
nitrogen oxides/Behavior of plants under extraterrestrial conditions:	546
nitrogen sources upon heterocyst formation in <i>Anabaena flos-aquae</i> A-37/	730
normothermic tumors after generalized body cooling/Regression of	763
normothermic tumors/Effect of generalized hypothermia on	693
normothermic tumors/Generalized hypothermia enhances anti-cancer drug a	695
normothermic tumors in generalized hypothermia/Enhancement of 5-fluoroc	694
normothermic tumors in shallow (30°C) hypothermia/Disappearance of	692
normothermic tumors of hypothermic hamsters/Effects of anti-cancer drug	762
Nucleolar alterations produced by Actinomycin D and 4-nitroquinoline N-	539
Nucleolar and cytoplasmic alterations produced by Actinomycin D and oth	625
Nucleolar "caps" - a morphologic entity produced by the carcinogen 4-n	486
Nucleolar "caps" induced by flying spot ultraviolet nuclear irradiation	755
Nucleolar "caps" produced by Actinomycin D/	540
Nucleolar changes induced by ionizing radiations and carcinogenic agent	478
Nucleolar studies/	687
null gravity/Evaluation of circulatory function at	482
(Nutrition)/Resistance of the quail, <i>Coturnix japonica</i> , to oxygen toxic	773
(Onion)/The experimental biology of ammonia-rich environments. Germinat	770
Optimal and dynamic characteristics of a continuous photosynthetic alga	724
organic synthesis in cells of successive developmental stages/The capac	492
organ size of cold and heat acclimated monkeys/Studies on the cellular	657
Orientation in systems with asymmetric density distribution/	702
Orientation of wheat seedling organs in relation to gravity/	729
Owens Lake/Photosynthetic halophiles from	705
oxidants and ionizing conditions on seed germination at subatmospheric	627
oxidation during embryonation/The comparative biochemistry and developm	660
Oxidative metabolism of citrate and lactate by <i>Pseudomonas aeruginosa</i> a	508
O <sub>2</sub> and air gaseous mixtures/Metabolic and thermal responses of man duri	747
oxygen/Air vs. lowered pO <sub>2</sub> in interrupted exposure to 100%	713
oxygen atmosphere at reduced pressure/Prolonged exposure of young rats	511

oxygen atmosphere/Metabolism and X-ray sensitivity of chick embryos inc	565
oxygen consumption of deer mice: relation of temperature and season/Ef	676
oxygen debt in aerobic work/The	545
oxygen/Delayed mortality in the adult chicken exposed to one atmosphere	648
oxygen-enriched environment/Metabolic changes in rats exposed to an	745
oxygen environment/Metabolism and X-ray sensitivity of chick embryos in	652
oxygen environment/Thermal responses of man during rest and exercise in	668
oxygen environment to air/Depression of metabolism in animals transferr	626
oxygen evolution step in photosynthesis/Kinetics and intermediates of t	727
Oxygen-hemoglobin dissociation in <i>Protopterus aethiopicus</i> /	704
oxygen levels/Effects of oxidants and ionizing conditions on seed germi	627
oxygen levels: effects of oxygen pressure and salts on germination of	630
oxygen-low pressure environment/Metabolic adaptation of rats to a high	677
oxygen-low pressure environment/The effect of discontinuous exposure of	678
oxygen pressure and salts on germination of winter rye/Experimentation	630
oxygen/Reaction of the chick to one atmosphere of	650
oxygen recovery/Carbon dioxide conversion for	665
oxygen: role of air vs. lowered $pO_2$ /Risk of mortality in interrupted	712
oxygen toxicity in mice/The effect of short periods of air breathing o	516
oxygen toxicity/Resistance of the chick to	563
oxygen toxicity: role of food intake/Resistance of the quail <i>Coturnix</i>	773
oxygen under simulated high altitude conditions/Lipid and protein metab	462
oxygen/X-ray sensitivity of chick embryos incubated in helium	728
 Palmella mucosa Kutz/An extracellular polysaccharide produced by	 555
Palmellococcus species as a carbon-energy source for the growth of Toru	533
parameters in exposure of large animals to high-energy protons/Physical	550
Pathology of chronic acceleration/	461
perception by plants/On the thresholds of gravitational force	672
performance after hypothermic cardiopulmonary bypass/Retention (memory)	760
( <i>Peromyscus</i> ) to temperature and altitude/Seasonal metabolic responses o	698
phantoms irradiation onmidirectionally with high-energy protons/Depth d	491
(Pharmacology) Generalized hypothermia enhances anti-cancer drug action	695
pH-carbon dioxide method for measuring aquatic primary productivity in	740
pH changes/Responses of heterotrophic cultures of <i>Chlorella vulgaris</i> Be	679
phlorizin on intestinal absorption in vivo and in vitro/Effects of	688
phosphoribulokinase and ATP, NADH-dependent $CO_2$ fixation/Regulation of	743
phosphorous sources by <i>Chlorella</i> /Utilization of	466
Phosphorylation in hydrogen bacteria/	720
Photoinhibition of chloroplast reactions. I. Kinetics and action spectr	725
Photoinhibition of chloroplast reactions. II. Multiple effects/	726
photoact I of photosynthesis/The reducing power generated in	598
photoact of photosynthesis/Reducing power generated in the second	596
photo-oxidation by detergent-treated chloroplasts/Plastocyanin	597
Photo-protection and human malignant cells/	527
Photoreactions and respiration/	470
photoreceptors/Lipids and the molecular structure of	709
Photoreceptor structures and energy transfer/	651
photosynthesis and consequences of excess/Radiation tolerances in	430
photosynthesis and respiration in laboratory microecosystems/The patter	581
photosynthesis/Hydromechanical method to increase efficiency of algal	521
Photosynthesis in cell development/	638
photosynthesis in cells of successive developmental stages; temperature	494
photosynthesis in optimally dense cultures of algae/Optimum conditions	431

photosynthesis/Kinetics and intermediates of the oxygen evolution step	727
photosynthesis/Reducing power generated in the second photoact of	596
photosynthesis/The reducing power generated in photoact I of	598
photosynthesis/Two light reactions in	518
photosynthetic algal gas exchanger/Optimal and dynamic characteristics	724
Photosynthetic halophiles from Owens Lake/	705
photosynthetic materials/An attempt at quantitation of the sharp light-	503
photosynthesis mechanisms/On the variability in the activity of the	495
Physical parameters in exposure of large animals to high-energy protons	550
physics of space radiation/The	449
physiological characteristics of the pig-tailed monkey, <i>Macaca nemestri</i>	537
physiological responses to artificial alteration in weight/Chronic acce	681
physiological studies on the pig-tailed monkey ( <i>Macaca nemestrina</i> )/Hand	538
(Physiology) Bacterial growth as an optimal process/	738
(Physiology) Cardiac excitability in high magnetic fields/	734
(Physiology) Effects of aerobic work performed during recovery from exh	723
physiology in animals during space flight/Evaluation of cardiovascular	468
(Physiology) The influence of vibrations on chromosomes/	683
(Physiology) The temperature of tree trunks calculated and observed/	670
(Physiology) Tilt table response and blood volume changes associated wi	718
(Physiology) Transpiration resistance and energy budget of <i>Populus sarg</i>	690
Pigment and pH changes/Responses of heterotrophic cultures of <i>Chlorella</i>	679
pigment P700/Relationship between light induced EPR signal and	459
pituitary irradiation/Progress report on	556
plant/Auxin transport in geotropic curvatures of a branched	603
(Plant) Auxin transport in <i>Zea mays</i> L. coleoptiles. I. Influence of gra	689
plant development: bases for experiment/Gravity and	467
(Plant) Effect of gravity compensation on the geotropic sensitivity of	663
(Plant) Orientation of wheat seedlings organs in relation to gravity/	729
(Plant) Nitrogen and helium-induced anoxia: different lethal effects o	685
(Plant) Role of indole-3-acetic acid in modification of geotropic respo	664
plants at sub-atmospheric oxygen-levels: effects of oxygen pressure an	630
plants/Effects of ultraviolet radiation on the leaves of higher	659
plants - convection, radiation, and transpiration/The micro-environment	684
(Plants) Geotropism in simulated low-gravity environments/	662
(Plant) Simulated low-gravity environments and respiratory metabolism i	721
plants grown under environmental stress and their implications for aero	717
plants in the field/Leaf temperatures of alpine	544
plants: observations on survival and growth of plants submerged in fre	701
plants submerged in fresh and saline waters/Micro-aerobic capabilities	701
plants/The influence of simulated low gravity environments on growth, d	751
plants under extraterrestrial conditions: seed germination in atmosphe	546
(Plant) The temperature of tree trunks, calculated and observed/	670
(Plant) Transpiration resistance and energy budget of <i>Populus sargentii</i>	690
Plastocyanin photo-oxidation by detergent-treated chloroplasts/	597
polysaccharides by the blue-green alga <i>Anabaena flosaquae</i> /Biosynthesis	531
polysaccharides of algae: effects on life-support systems/Extracellula	532
polysaccharide produced by <i>Palmella mucosa</i> Kutz/An extracellular	555
<i>Populus sargentii</i> leaves/Transpiration resistance and energy budget of	690
potential in corn coleoptile sections/Auxin transport and geoelectric	609
pO <sub>2</sub> in interrupted exposure to 100% oxygen/Air vs. lowered	713
pO <sub>2</sub> /Risk of mortality in interrupted exposure to 100% oxygen: role of	712
Precambrian microfossil <i>Kakabekia umbellata</i> Barghoorn in NH <sub>3</sub> -rich atmos	700
Preliminary studies on the extracellular products of <i>Hydrogenomonas eut</i>	507

pressure and salts on germination of winter rye/Experimentation with pl	630
pressure-artificial atmospheres/An improved system for prolonged exposu	599
pressure environment/Metabolic adaptation of rats to a high oxygen-low	677
pressure environment/The effect of discontinuous exposure of rats to a	678
pressure/Prolonged exposure of young rats to an oxygen atmosphere at re	511
pressure tester of egg shell strength/A hydrostatic	632
Primate bio-instrumentation for two Jupiter ballistic flights/	429
(Primate) Laboratory maintenance of the squirrel monkey/	465
primates/Chronic intravascular catheterization: a technique for implan	744
procedure for individual urinary 17-ketosteroids/Improved	674
propagation considering inhibitors and variable cell composition/Dynami	733
propagation of microorganisms/Continuous	464
protein/Hydrogenomonas eutropha as a source of	749
protein metabolism in rats in oxygen under simulated high altitude cond	462
Proton activation in space vehicles/	448
proton beam after scattering in a thick target/Characteristics and inte	496
proton dose rates in spheres and slabs of tissue/Primary and secondary	647
protons and alpha particles on small mammals/Effect of high-energy	636
protons/Depth dose in large phantoms irradiation omnidirectionally with	491
protons, 100 kVp X rays and 250 kVp X rays/Difference in injury mode, d	498
protons/Particulate radiation: electrons and	433
protons/Physical parameters in exposure of large animals to high-energy	550
protons/Results of computations of depth dose in tissue irradiated by	641
Protopterus aethiopicus/Oxygen-hemoglobin dissociation in	704
Pseudemys scripta-elegans/General and comparative biology of experiment	629
pupillodilation with cyclotron-accelerated alpha particles/Blockage of	515
pyruvate during work and recovery/Distribution of blood lactate and	610
quail, Coturnix japonica, to oxygen toxicity: role of food intake/Resi	773
quantitation of the sharp light-induced electron paramagnetic resonance	503
rabbit/Radiosensitivity of the vestibular apparatus of the	604
rabbit skin, using integral dose as a basis for comparison/Relative eff	510
radiation and growth/Gravity,	529
radiation, and transpiration/The micro-environment of broad leaf plants	684
radiation (Bragg-Peak lithium ions) on normal rabbit skin, using integr	510
radiation/Cellular and sub-cellular responses to ultraviolet	528
(Radiation) Effect of high-energy protons and alpha particles on small	636
radiation effects with magnetic fields/Modification of	453
radiation: electrons and protons/Particulate	433
radiation in the hibernator Citellus tridecemlineatus/Intestinal absorp	535
radiation/Multicompartment interpretation of	484
radiation on the leaves of higher plants/Effects of ultraviolet	659
(Radiation) Primary and secondary proton dose rates in spheres and slab	647
radiation response during embryonic development by the use of elevated	488
radiations and carcinogenic agents/Nucleolar changes induced by ionizin	478
radiations and other environmental stresses in biological systems/Inter	772
radiations/Cellular and sub-cellular effects of ionizing	524
radiations for induction of mutations and lethality in diploid Saccharo	534
radiations on various biological test objects/Analysis of the effects o	557
radiations on various strains of cells/Analysis of the effects of high-	558
radiation survey made in Egypt, India, and Ceylon in January 1963/Repor	617
radiation syndrome with high-energy particulate radiation/Studies on th	454
radiation syndrome with high-energy particulate radiation/Studies on th	490

radiation/The physics of space	449
radiation/The sensitivity of X-irradiated cells to ultraviolet	525
Radiation tolerances in photosynthesis and consequences of excess/	430
radicals in solid biological compounds exposed to various ionizing radi	591
radicals in solid biological substances by heavy ions/Production of fre	593
radicals produced by irradiation/On the spatial distribution of	567
Radiographic bone densitometry/	686
radio-sensitivity of haploid yeast cells to densely ionizing particles/	475
Radiosensitivity of the vestibular apparatus of the rabbit/	604
rat/Changes in spontaneous activity as a measure of sensitivity to rota	584
rats/Acclimatization to deep hypothermia by	675
rats/Acclimatization to deep hypothermia by	703
rats after supercooling to -3C/Survival of young	618
rats after twelve exposures to deep hypothermia/Instrumental acquisitio	691
rats/Critical body temperature for intracranial self-stimulation in whi	619
rats/Critical temperature for instrumental response acquisition in hypo	614
rats exposed to an oxygen-enriched environment/Metabolic changes in	745
rats/Extracorporeal circulation in hypothermic	758
rats/Hypothermic cardiopulmonary bypass in white	759
rats/Implantation of large polyethylene cannulas in the aorta and right	761
rats in oxygen under simulated high altitude conditions/Lipid and prote	462
rats/Non-phosphorylating respiration of mitochondria from brown adipose	771
rats/The critical temperature for intracranial self-stimulation in whit	764
rats/Time dependent responses of brown fat in cold-exposed	635
rats/Time dependent responses of brown fat in cold-exposed	766
rats to a high oxygen-low pressure environment/Metabolic adaptation of	677
rats to a high oxygen-low pressure environment/The effect of discontinu	678
rats to an oxygen atmosphere at reduced pressure/Prolonged exposure of	511
RBE of 730-MeV protons, 100 kVp X rays/Difference in injury mode, dose	498
reactions. II. Multiple effects/Photoinhibition of chloroplast	726
recording system for measuring bioelectric transients/A	438
recumbency/Tilt table response and blood volume changes associated wit	718
regenerative systems/Combined photosynthetic	519
Regression of normothermic tumors after generalized body cooling/	763
resistance and energy budget of <i>Populus sargentii</i> leaves/Transpiration	690
Resistance of the chick to oxygen toxicity/	563
Resistance of the quail, <i>Coturnix japonica</i> to oxygen toxicity: role of	773
Respiration and terminal oxidation during embryonation/The comparative	660
respiration of mitochondria from brown adipose tissue of rats/Non-phosp	771
respiration/Photoreactions and	470
Respiratory activity of avian blood cells/	654
respiratory metabolism in <i>Avena</i> seedlings/Simulated low-gravity environ	721
response acquisition in hypothermic rats/Critical temperature for instr	614
response and blood volume changes associated with thirty days of recumb	718
response during embryonic development by the use of elevated temperatur	488
responses in clinostat rotated <i>Avena</i> seedlings/Role of indole-3-acetic ..	664
responses in hypothermia and hibernation/Cardiovascular	595
responses in prolonged hypothermia/Cardiovascular	621
responses of deer mice ( <i>Peromyscus</i> ) to temperature and altitude/Season	698
responses of brown fat in cold-exposed rats/Time dependent	635
responses of brown fat in cold-exposed rats/Time dependent	766
Responses of <i>Cladonia rangiferina</i> to environmental stress factors: te	628
Responses of heterotrophic cultures of <i>Chlorella vulgaris</i> Beyerinck to	679
Responses of heterotrophic cultures of <i>Chlorella vulgaris</i> Beyerinck to	680

responses of man during rest and exercise in a helium-oxygen environmen	668
responses of man during exposure to He-O <sub>2</sub> and air gaseous mixtures/Meta	747
responses to external electromagnetic energy/Neurological	458
responses to ultraviolet radiation/Cellular and sub-cellular	528
response to immobilization and ascorbic acid deficiency/The influence	706
rest and exercise in a helium-oxygen environment/Thermal responses of m	668
retina and visual pathways/Bioelectric sensitivity to irradiation of th	514
Ribulosediphosphate carboxylase, phosphoribulokinase and ATP, NADH-depe	743
(Rodent) Acclimatization to deep hypothermia by rats/	675
(Rodent) Active transport of D-galactose and concomitant metabolic acti	739
(Rodent) Biochemistry of brown fat and liver of hibernating golden-mant	658
(Rodent) Effect of altitude on oxygen consumption of deer mice: relati	676
(Rodent) Effects of anti-cancer drugs on normothermic tumors of hypothe	762
(Rodent) Glucose intestinal transport and absorption following whole bo	731
(Rodent) Hypothermic cardiopulmonary bypass in white rats/	759
(Rodent) Implantation of large polyethylene cannulas in the aorta and r	761
(Rodent) Intestinal absorption in hamsters and ground squirrels, in viv	732
(Rodent) Instrumental acquisition in rats after twelve exposures to dee	691
(Rodent) Metabolic adaptation of rats to a high oxygen-low pressure env	677
(Rodent) Metabolic changes in rats exposed to an oxygen-enriched enviro	745
(Rodent) Non-phosphorylating respiration of mitochondria from brown adi	771
rodents/A subminiature temperature transmitter for use with	562
(Rodent) The critical temperature for intracranial self-stimulation in	764
(Rodent) The effect of discontinuous exposure of rats to a high oxygen-	678
(Rodent) The effect of immobilization on skeletal metabolism in guinea	642
(Rodent) Time dependent responses of brown fat in cold-exposed rats/	766
rotation in the white rat/Changes in spontaneous activity as a measure	584
(Rotation) Role of indole-3-acetic acid in modification of geotropic re	664
rotation room/Observations of canal sickness and adaptation in chimpanz	442
rye/Experimentation with plants at sub-atmospheric oxygen-levels: effe	630
rye in deuterium oxide/Germination and seedling growth of winter	548
rye seeds/Nitrogen and helium-induced anoxia: different lethal effects	685
 Saccharomyces cerevisiae, in relation to ionization density and oxygen	534
Saimiri sciureus as an experimental animal/	501
(Saimiri sciureus) Histopathologic evaluation of a laboratory primate:	513
(Saimiri sciureus) The effects of environmental temperature changes on	585
satellites/Biological of instrumentation designs for living human cell	523
scintillation/Argon-helium	440
Seasonal metabolic responses of deer mice (Peromyscus) to temperature a	698
season/Effect of altitude on oxygen consumption of deer mice: relation	676
Sea urchin mitosis in high magnetic fields/	697
secretions/Van Slyke's buffer values for cell	639
sedimentation test in domestic fowl/The erythrocyte	748
seed, a novel capability among angiosperms/The experimental biology of	770
seed germination at subatmospheric oxygen levels/Effects of oxidants an	627
seed/An improved medium for rapid initiation of Arabidopsis tissue cult	699
seed germination in atmospheres containing nitrogen oxides/Behavior of	546
seed viability conditioned by chemically inert gases/Differential losse	600
seedling growth of winter rye in deuterium oxide/Germination and	548
seedling organs in relation to gravity/Orientation of wheat	729
seedlings/Effect of gravity compensation on the geotropic sensitivity o	663
seedlings/Role of indole-3-acetic acid in modification of geotropic res	664
seedlings/Simulated low-gravity environments and respiratory metabolism	721



seeds/Nitrogen and helium-induced anoxia: different lethal effects on	685
self-stimulation in white rats/Critical body temperature for intracranial	619
self-stimulation in white rats/The critical temperature for intracranial	764
sensitivity of chick embryos incubated in helium-oxygen/X-ray	728
sensitization by iododeoxyuridine of cultured human cells to the lethal	559
sensitivity of Avena seedlings/Effect of gravity compensation on the ge	663
sensitivity of chick embryos incubated in a helium-oxygen environment/M	652
sensitivity of chick embryos incubated in a helium-oxygen atmosphere/Me	565
sensitivity of X-irradiated cells to ultraviolet radiation/The	525
sensitivity to irradiation of the retina and visual pathways/Bioelectri	514
sensitivity to rotation in the white rat/Changes in spontaneous activit	584
Serratia indica/Oxidative metabolism of citrate and lactate by Pseudomo	508
17-ketosteroids/Improved procedure for individual urinary	674
Shielding and activation considerations for a meson factory/	443
shielding calculations for high-energy accelerators: applications to s	450
signal in photosynthetic materials/An attempt at quantitation of the sh	503
simulated high altitude conditions/Lipid and protein metabolism in rats	462
simulated low gravity environments on growth, development and metabolis	751
simulated low-gravity environments/Geotropism in	662
(Simulation) Terrestrial models of Martian life/	769
Skeletal changes with age/	643
skeletal metabolism in guinea pigs with varying bone thickness/The effe	642
skeletal response to immobilization and ascorbic acid deficiency/The in	706
skin, using integral dose as a basis for comparison/Relative efficiency	510
space - a new approach/Sustaining life in	505
space biology: an experimental approach to the basic biology of stress	768
(Space biology) Constitutional changes in plants grown under environmen	717
space biology widens/Our view of	447
(Spacecraft) Sterilization of interplanetary vehicles/	755
space flight/Evaluation of cardiovascular physiology in animals during	468
space/Life support systems and outer	666
space missions/Life support systems for	506
space/Question of sustaining man in	460
space travel/Biological effects of magnetic fields in	456
space travel/Biological effects of magnetic fields in their relation to	499
space vehicles/Proton activation in	448
spectra/Photoinhibition of chloroplast reactions. I. Kinetics and actio	725
spectrum for and mechanism of the light requirement for heterotrophic g	680
squirrel monkeys in a slow rotation room/Observations of canal sickness	442
squirrel monkey/Laboratory maintenance of the	465
squirrel monkeys/Influence of strong magnetic fields on the electrocard	502
squirrel monkey (Samiri sciureus)/Histopathologic evaluation of a labor	513
squirrel monkey (Samiri sciureus)/The effects of environmental temperat	585
squirrels (Citellus lateralis)/Biochemistry of brown fat and liver of h	658
statistics and dynamics/A model for microbial population	722
sterols from Chlorella/Hydrocarbons and	615
Sterols of Chlorella. I. The naturally-occurring sterols of Chlorella v	616
stress and their implications for aerospace biology/Constitutional chan	717
stress conditions: experiments with the turtle/General and comparative	629
stress/Elements of space biology: an experimental approach to the basi	768
stresses in biological systems/Interactions of radiations and other env	772
stress factors: temperature, radiation and water/Responses of Cladonia	628
structure of photoreceptors/Lipids and the molecular	709
structures and energy transfer/Photoreceptor	651

Studies on the mammalian radiation syndrome with high-energy particulat	454
study of the erythroid development sequence in mammals/A cytophotometri	452
sub-atmospheric oxygen-levels: effects of oxygen pressure and salts on	630
sub-cellular effects of ionizing radiations/Cellular and	524
Sub-cellular effects of X-radiation/	477
sub-cellular responses to ultraviolet radiation/Cellular and	528
substances by heavy ions/Production of free radicals in solid biologica	593
sugar and effects of Co <sup>60</sup> irradiation in ground squirrel, Citellus trid	564
sugars in the hibernator, Citellus tridecemlineatus/Intestinal absorpti	608
sulfate/Microchemical urinalysis. II. Microturbidimetric determination	589
survey made in Egypt, India, and Ceylon in January 1963/Report on a rad	617
survival and growth of plants submerged in fresh and saline waters/Micr	701
Survival and growth of terrestrial microorganisms in ammonia-rich atmos	631
survival in hypothermic animals/Factors limiting	716
Survival of animals in magnetic fields of 120,000 gauss/	434
Survival of animals in magnetic fields of 140,000 Oe/	500
Survival of young rats after supercooling to -3C/	618
symbiotic coelenterates and aquatic ecosystems/Metabolic similarities b	656
syndrome with high-energy particulate radiation/Studies on the mammalia	454
syndrome with high-energy particulate radiation/Studies on the mammalia	490
synthesis in cells of successive developmental stages/The capacity for	492
synthesis of animal feeds from human waste substrates/Microbial	437
synthesis/Quantitative measurement of urinary nitrogen and total solids	463
system/Growth of Hydrogenomonas eutropha in urine for application to a	753
system/Bioregeneration in a closed ecological	719
system for measuring bioelectric transients/A recording	438
system for prolonged exposure of small animals to low pressure-artifici	599
systems/A continuous culture apparatus for the microbial utilization of	512
systems and outer space/Life support	666
systems/Combined photosynthetic regenerative	519
systems for space missions/Life support	506
systems/Interactions of radiations and other environmental stresses in	772
systems of compartments/On some metric properties of the	624
systems with asymmetric density distribution/Orientation in	702
system, with special reference to succession and stability/The case for	741
technique for implanting and maintaining arterial and venous catheters	744
Techniques used in shielding calculations for high-energy accelerators:	450
television microscopy/Flying and stepping spot	522
temperature and altitude/Seasonal metabolic responses of deer mice (Per	698
temperature and light intensity/The dependence of cell division in Chlo	640
temperature and season/Effect of altitude on oxygen consumption of deer	676
temperature changes on the EKG of the squirrel monkey (Samiri sciureus)	585
Temperature dependence of wing abnormality in Tribolium confusum/	487
temperature effects/Injury and recovery of photosynthesis in cells of s	494
temperature for intracranial self-stimulation on white rats/Critical bo	619
temperature for intracranial self-stimulation in white rats/The critica	764
temperature in controlled environments/Leaf	520
temperature of growth of bacteria. Molecular mechanisms of temperature	754
temperature of tree trunks, calculated and observed/The	670
temperature on the production of free radicals in solid biological comp	591
temperature regulation in the tundra vole, Microtus oeconomus/Growth ra	560
temperatures/Modification of radiation responses during embryonic devel	488
temperatures of alpine plants in the field/Leaf	544

Temperature selection in Alaskan microtines/	756
temperature to body temperature of man in a He-O <sub>2</sub> atmosphere/Relationsh	667
Temperature tolerance: algae/	554
temperature transmitter for use with rodents/A subminiature	562
terrestrial microorganisms in ammonia-rich atmospheres/Survival and gro	631
Terrestrial models of Martian life/	769
tester of egg shell strength/A hydrostatic pressure	632
thawing/Factors affecting the rate of killings of Escherichia coli by r	613
(Thermal balance) Transpiration resistance and energy budget of Populus	690
thermal responses of man during exposure to He-O <sub>2</sub> and air gaseous mixtu	747
Thermal responses of man during rest and exercise in a helium-oxygen en	668
thermoregulation in deer mice at altitude/Brown fat and	594
Tilt table response and blood volume changes associated with thirty day	718
Time dependent responses of brown fat in cold-exposed rats/	766
time-lapse study/Nucleolar and cytoplasmic alterations produced by Acti	625
tissue catecholamine contents/Effects of X-irradiation during hibernati	480
tissue culture from seed/An improved medium for rapid initiation of Ara	699
tissue equivalent/Neutron depth dose from ( $\alpha$ ,h) and ( $\gamma$ ,h) sources in	451
tissue irradiated by protons/Results of computations of depth dose in	641
tissue of rats/Non-phosphorylating respiration of mitochondria from bro	771
tissue/Primary and secondary proton dose rates in spheres and slabs of	647
titrator/Microchemical urinalysis. III. A simple automatic recording ti	590
tolerance: algae/Temperature	554
tolerances in photosynthesis and consequences of excess/Radiation	430
Torula utilis/Palmellocooccus species as a carbon-energy source for the	533
toxicity in mice/The effect of short periods of air breathing on oxygen	516
toxicity/Resistance of the chick to oxygen	563
toxicity: role of food intake/Resistance of the quail Coturnix japonic	773
transmitter for use with rodents/A subminiature temperature	562
Transpiration resistance and energy budget of Populus sargentii leaves/	690
transpiration/The micro-environment of broad leaf plants - convection,	684
tree trunks, calculated and observed/The temperature of	670
Tribolium confusum/Temperature dependence of wing abnormality in	487
Tribolium/Heavy ion localization of sensitive embryonic sites in	549
tumors after generalized bodycooling/Regression of normothermic	763
tumors after 10-hour generalized hypothermia/Disappearance of euthermic	622
tumors/Effect of generalized hypothermia on normothermic	693
tumors in generalized hypothermia/Enhancement of 5-fluorocil action on	694
tumors in shallow (30°C) hypothermia/Disappearance of normothermic	692
tumors (37°C) in shallow hypothermia/Disappearance of euthermic	623
tumors/Effect of hypothermia on growth and development of	620
tumors/Generalized hypothermia enhances anti-cancer drug action on norm	695
turtle, Chrysemys picta/Renewal of intestinal epithelium in fresh water	566
turtle, Pseudemys scripta-elegans/General and comparative biology of ex	629
Ultrastructural alterations induced in E. coli B by gravity/	526
Ultrastructural changes produced in bacteria by gravity/	476
ultrastructural changes produced in bacteria by gravity and X-radiation	530
Ultraviolet microbeam irradiation of living cell membranes/	606
ultraviolet nuclear irradiation/Nucleolar "caps" induced by flying spot	755
ultraviolet radiation on the leaves of higher plants/Effects of	659
urinalysis/Microchemical	588
urinalysis. II. Microturbidimetric determination of sulfate/Microchemic	589
urinalysis. III. A simple automatic recording time-flow titrator/Microc	590

urinary 17-ketosteroids/Improved procedure for individual	674
urinary nitrogen and total solids depletion in a closed ecological syst	463
urine for application to a bioregenerative life support system/Growth o	753
venous catheters in laboratory primates/Chronic intravascular catheteri	744
ventricle of white rats/Implantation of large polyethylene cannulas in	761
Venturi liquid-gas contactor/Mass transfer characteristics of a	455
vestibular apparatus of the rabbit/Radiosensitivity of the	604
vibration and centrifugation on braconid fecundity, fertility and life	673
vibrations on chromosomes/The influence of	683
vole, <i>Microtus oeconomus</i> /Growth rate and the development of temperature	560
waste substrates/Microbial synthesis of animal feeds from human	437
weight/Chronic acceleration studies - physiological responses to artifi	681
weightless environment/Biotelemetry of the triaxial ballistocardiogram	517
weightless environment/Triaxial ballistocardiogram in a	653
weightlessness on mammals/The effects of	536
wheat seedling organs in relation to gravity/Orientation of	729
work and recovery/Distribution of blood lactate and pyruvate during	610
working capacity/Effect of high altitude on maximal	682
work performed during recovery from exhausting work/Effects of aerobic	723
work/The oxygen debt in aerobic	545
X-irradiated cells to ultraviolet radiation/The sensitivity of	525
X-irradiated male mice/Effects of lipids on haematopoietic organs of	441
X-irradiated male mice/Fertility studies	432
X-irradiation/during hibernation on tissue catecholamine contents/Effec	480
X-radiation/A comparison of the ultrastructural changes produced in bac	530
X-radiation/Sub-cellular effects of	477
X-rays and 250 kVp X-rays/Difference in injury mode, dose-rate dependen	498
X-rays and heavy ions/The sensitization by iododeoxyuridine of cultured	559
X-ray sensitivity of chick embryos incubated in a helium-oxygen atmosph	565
X-ray sensitivity of chick embryos incubated in helium-oxygen/	728
X-ray sensitivity of chick embryos incubated in a helium-oxygen environ	652
yeast cells to densely ionizing particles/Effects of glycerol and of an	475
<i>Zea mays</i> L. coleoptiles. I. Influence of gravity on the transport of in	689

## SENIOR AUTHORS AND ABBREVIATED LABORATORY ADDRESSES

The individuals listed below are those authors whose names appear as senior authors of a paper. They are in alphabetical order, with the laboratory or institution in which they performed their research designated in abbreviation. These abbreviations for the laboratories and universities are written out in full on pages 59 through 61 which is an alphabetical listing with the complete addresses given.

Aceto, H., Jr. (U.C., Donner Lab. & Donner Pavil.)  
Adams, L.R. (U.C., Donner Lab. & Donner Pavil.)  
Altman, P.L. (Fed. Amer. Soc. Exp. Biol.)  
Amer, N.M. (U.C., Donner Lab. & Donner Pavil.)  
Ashikawa, K. (U.C., Donner Lab. & Donner Pavil.)  
Barnstein, N.J. (U.C., Dept. Physiol.-Ana.)  
Bauer, W.G. (U. Minn., Inst. Technol.)  
Beinert, H. (Res. Inst. Adv. Stud.)  
Beischer, D.E. (USN, Sch. Aviat. Med.)  
Besch, E.L. (U.C., Davis)  
Beyers, R.J. (U. Ga., Inst. Ecol.)  
Bond, A.D. (Okla. U., Dept. Chem.)  
Bongers, L. H., (Res. Inst. Adv. Stud.)  
Bowers, R.W. (Ohio St. U., Dept. Physiol.)  
Brown, L.R. (Miss. St. U., Dept. Microbiol.)  
Burton, R.R. (U.C., Davis)  
Cahill, C.L. (Okla. U., Dept. Chem.)  
Calloway, D.H. (U.C., Berkeley, Dept. Soils & Plant Nutri.)  
Chaffee, R.R.J. (UCLA, Dept. Physiol.)  
Cline, M.G. (Utah St. U., Plant Sci. Dept.)  
Close, P. (USN, Sch. Aviat. Med.)  
Cody, R.M. (Miss. St. U., Dept. Microbiol.)  
Cooke, G.D. (U. Ga., Inst. Ecol.)  
Costello, L.C. (U. Md., Med. Sch.)  
D'Angio, G.J. (U.C., Donner Lab. & Donner Pavil.)  
Davis, E.B. (Miss. St. U., Dept. Microbiol.)  
De Qicco, B.T. (Cath. U.)  
Dedolph, R.R. (AEC, Argonne)  
Dines, J.H. (Ohio St. U., Dept. Physiol.)  
Eakman, J.M. (U. Minn., Inst. Technol.)  
Eskin, A. (USN, Sch. Aviat. Med.)  
Foster, J.F. (Battelle Mem. Inst.)  
Fox, E.L. (Ohio St. U., Dept. Physiol.)  
Fredrickson, A.G. (U. Minn., Inst. Technol.)  
Furry, D.E. (USN, Sch. Aviat. Med.)  
Gaffey, C.T. (U.C., Donner Lab. & Donner Pavil.)  
Gainey, M.D. (U.C., Donner Lab. & Donner Pavil.)  
Galloway, R.A. (U. Md., Dept. Bot.)  
Gates, D.M. (U. Colo., Arctic & Alpine Res.)  
Gisolfi, C. (Ind. U., Dept. Physiol.)  
Goldner, B.H. (TRW Space Tech. Lab.)  
Gordon, S. (AEC, Argonne)

Grosch, D.S. (U.N.C., Genet. Dept.)  
 Grunbaum, B.W. (U.C., Dept. Physiol.-Ana.)  
 Gumma, M.R. (U. Mo., Space Sci. Res. Cent.)  
 Hansen, J.T. (U.C., Dept. of Physiol.-Ana.)  
 Henriksen, T. (U.C., Donner Lab. & Donner Pavil.)  
 Hiatt, E.P. (Ohio St. U., Dept. Physiol.)  
 Hixon, W.C. (USN, Sch. Aviat. Med.)  
 Hoch, G. (Res. Inst. Adv. Stud.)  
 Hock, R.J. (UCLA, Dept. Physiol.)  
 Hollaender, A. (AEC, Oak Ridge)  
 Howell, J.A. (U. Minn., Inst. Technol.)  
 Ingraham, J.L. (U.C., Dept. Bacteriol.)  
 Jenkins, T. (U.C., Donner Lab. & Donner Pavil.)  
 Jones, L.W. (Res. Inst. Adv. Stud.)  
 Jordan, J.P. (Okla. U., Dept. Chem.)  
 Karlander, E.P. (U. Md., Dept. Bot.)  
 Kent, K.M. (Emory U., Dept. Physiol.)  
 Klausen, K. (Ind. U., Dept. Physiol.)  
 Knepton, J.C. (USN, Sch. Aviat. Med.)  
 Kok, B. (Res. Inst. Adv. Stud.)  
 Kollias, J. (Okla. U., Dept. Chem.)  
 Krauss, R.W. (U. Md., Dept. Bot.)  
 Kreith, F. (U. Colo., Arctic & Alpine Res.)  
 Latterell, R.L. (Union Carbide)  
 Lessler, M.A. (Ohio St. U., Dept. Physiol.)  
 Lyman, J.T. (U.C., Donner Lab. & Donner Pavil.)  
 Lyon, C.J. (Dartmouth Coll., Dept. Biol. Sci.)  
 McDonald, L.W. (U.C., Donner Lab. & Donner Pavil.)  
 McFadden, B.A. (U. Ill., Dept. Microbiol.)  
 Mack, P.B. (Tex. Woman's U.)  
 Manney, T.R. (U.C., Donner Lab. & Donner Pavil.)  
 Maqsood, M. (U.C., Donner Lab. & Donner Pavil.)  
 Marr, J.W. (U. Colo., Arctic & Alpine Res.)  
 Meek, J.C. (USN, Sch. Aviat. Med.)  
 Mellor, R.S. (Utah St. U., Plant Sci. Dept.)  
 Mickelson, J.C. (Miss. St. U., Dept. Microbiol.)  
 Miller, R.L. (U. Minn., Inst. Technol.)  
 Montgomery, P. O'B. (U. Tex., Southwestern Med. Sch.)  
 Moore, B.G. (Miss. St. U., Dept. Microbiol.)  
 Morrison, P. (U. Alaska, Inst. Arctic Biol.)  
 Mortimer, R.K. (U.C., Donner Lab. & Donner Pavil.)  
 Moyer, B.J. (U.C., Donner Lab. & Donner Pavil.)  
 Moyer, J.E. (U.S. Dept. Interior)  
 Mussachia, X.J. (U. Mo., Space Sci. Res. Cent.)  
 Naqvi, S. (AEC, Argonne)  
 Newton, J.L. (Ind. U., Dept. Physiol.)  
 Oda, N. (U.C., Donner Lab. & Donner Pavil.)  
 Odum, E.P. (U. Ga., Inst. Ecol.)  
 Osretkar, A. (U. Md., Dept. Bot.)  
 Pace, N. (U.C., Dept. Physiol.-Ana.)  
 Packer, E.L. (U.C., Dept. Bacteriol.)  
 Panuska, J.A. (Emory U., Dept. Physiol.)  
 Parkhurst, D.F. (U. Colo., Arctic & Alpine Res.)  
 Patterson, G.W. (U. Md., Dept. Bot.)  
 Patterson, W.H. (U.C., Donner Lab. & Donner Pavil.)

Polissar, M.J. (U.C., Donner Lab. & Donner Pavil.)  
 Popovic, P. (Emory U., Dept. Physiol.)  
 Popovic, V.P. (Emory U., Dept. Physiol.)  
 Rahlman, D.F. (U.C., Dept. Physiol.-Ana.)  
 Ramkrishna, D. (U. Minn., Inst. Technol.)  
 Rehr, E.B. (U.C., Berkeley, Dept. Soils & Plant Nutri.)  
 Reno, V.R. (USN, Sch. Aviat. Med.)  
 Rescigno, A. (U.C., Donner Lab. & Donner Pavil.)  
 Reynolds, R.C. (U. Tex., Southwestern Med. Sch.)  
 Rhoades, R.A. (Ohio St. U., Dept. Physiol.)  
 Roberts, J.C. (UCLA, Dept. Physiol.)  
 Robinson, S. (Ind. U., Dept. Physiol.)  
 Salisbury, F.B. (Utah St. U., Plant Sci. Dept.)  
 Schneider, E.G. (Ind. U., Dept. Physiol.)  
 Shen-Miller, J. (AEC, Argonne)  
 Siegel, S.M. (Union Carbide)  
 Sisler, F. (Env. Res. Inst.)  
 Slater, J.V. (U.C., Donner Lab. & Donner Pavil.)  
 Sluka, S.J. (U.C., Davis)  
 Smith, A.H. (U.C., Davis)  
 Smith, R.E. (UCLA, Dept. Physiol.)  
 Sondhaus, C.A. (U.C., Donner Lab. & Donner Pavil.)  
 Sorokin, C. (U.Md., Dept. Bot.)  
 South, F.E. (U.Mo., Space Sci. Res. Cent.)  
 Steward, P.G. (U.C., Donner Lab. & Donner Pavil.)  
 Swan, H. (Res. Inst. Biol. Sci.)  
 Swanson, C.H. (U. Minn., Inst. Technol.)  
 Sweeny, K. (Space-General Corp.)  
 Thornton, P.A. (V.A. Hosp.)  
 Tischer, R.G. (Miss. St. U., Dept. Microbiol.)  
 Tobias, C.A. (U.C., Donner Lab. & Donner Pavil.)  
 Todd, P.W. (U.C., Donner Lab. & Donner Pavil.)  
 Tsuchiya, H.M. (U. Minn., Inst. Technol.)  
 Tym, R. (U.C., Donner Lab. & Donner Pavil.)  
 Vela, G.R. (U.S. Dept. Interior)  
 Viereck, E.G. (U. Alaska, Inst. Arctic Biol.)  
 Vogt, F.B. (Tex. Woman's U.)  
 Wallace, R. (U.C., Donner Lab. & Donner Pavil.)  
 Ward, C.H. (U.S. Dept. Interior)  
 Warman, N.E. (U. Alaska, Inst. Arctic Biol.)  
 Weiss, H.S. (Ohio St. U., Dept. Physiol.)  
 Westhoff, D.D. (U. Mo., Space Sci. Res. Cent.)  
 Wright, R.A. (Ohio St. U., Dept. Physiol.)  
 Wyard, S.J. (U.C., Donner Lab. & Donner Pavil.)  
 Ziobro, M. (Cath. U.)

LABORATORY ADDRESSES OF THE ENVIRONMENTAL BIOLOGY PROGRAM

Argonne National Laboratory (AEC, Argonne)  
9700 South Cass Avenue  
Argonne, Illinois, 60440

Battelle Memorial Institute (Battelle Mem. Inst.)  
Dept. of Chemistry and Chemical Engineering  
505 King Avenue  
Columbus, Ohio, 43201

Catholic University of America (Cath. U.)  
Dept. of Biology  
Washington, D. C., 20017

Dartmouth College (Dartmouth Coll., Dept. Biol. Sci.)  
Dept. of Biological Sciences  
Hanover, New Hampshire, 03755

Emory University (Emory U., Dept. Physiol.)  
Dept. of Physiology  
Atlanta, Georgia, 30322

Environmental Research Institute (Env. Res. Inst.)  
Washington, D. C., 20234

Federation of American Societies for Experimental Biology  
(Fed. Amer. Soc. Exp. Biol.)  
2025 I., N.W.  
Washington, D. C., 20006

Indiana University (Ind. U., Dept. Physiol.)  
Dept. of Physiology  
Bloomington, Indiana, 47401

Mississippi State University (Miss. St. U., Dept. Microbiol.)  
Dept. of Microbiology  
State College, Mississippi, 39762

Oak Ridge National Laboratory (AEC, Oak Ridge)  
Oak Ridge, Tennessee, 37830

Ohio State University (Ohio St. U., Dept. Physiol.)  
Dept. of Physiology  
410 West 10th Avenue  
Columbus, Ohio, 43210

Oklahoma City University (Okla. U., Dept. Chem.)  
Dept. of Chemistry  
Oklahoma City, Oklahoma, 73106

Research Institute for Advanced Studies (Res. Inst. Adv. Stud.)  
1450 South Rolling Road  
Baltimore, Maryland, 21227



Research Institute for Biological Sciences (Res. Inst. Biol.  
Sci.)  
67 West Lakeridge Road  
Denver, Colorado, 80227

Space-General Corporation (Space-General Corp.)  
El Monte, California, 91713

Texas Woman's University (Tex. Woman's U.)  
Nelda Childers Stark Laboratory for Human Nutrition Research  
Denton, Texas, 76201

TRW Space Technology Laboratories (TRW Space Tech. Lab.)  
One Space Park  
Redondo Beach, California, 90278

Union Carbide (Union Carbide)  
P. O. Box 278  
Tarrytown, New York, 10591

U.S. Department of the Interior (U.S. Dept. Interior)  
Federal Water Pollution  
Control Administration  
Ada, Colorado, 74820

U.S. Naval School of Aviation Medical Center (USN Sch. Aviat.  
Med.)  
Pensacola, Florida, 32512

University of Alaska (U. Alaska, Inst. Arctic Biol.)  
Institute of Arctic Biology  
Fairbanks, Alaska, 99735

University of California (U.C., Dept. Physiol.-Ana.)  
Dept. of Physiology-Anatomy  
Berkeley, California, 94720

University of California (U.C., Donner Lab. & Donner Pavil.)  
Donner Laboratory & Donner Pavilion  
Berkeley, California, 94720

University of California (U.C., Davis)  
College of Agriculture  
Davis, California, 95616

University of California (U.C., Dept. Bacteriol.)  
Dept. of Bacteriology  
Davis, California, 95616

University of California (U.C.L.A., Dept. Physiol.)  
Dept. of Physiology  
School of Medicine  
Los Angeles, California, 90024

University of Colorado (U. Colo., Arctic & Alpine Res.)  
Institute of Arctic & Alpine Research  
Boulder, Colorado, 80302

University of Georgia (U. Ga., Inst. Ecol.)  
Institute of Ecology  
Biological Sciences Building  
Athens, Georgia, 30601

University of Illinois (U. Ill., Dept. Microbiol.)  
Dept. of Microbiology  
Urbana, Illinois, 61803

University of Maryland (U. Md., Med. Sch.)  
Medical School  
Baltimore, Maryland, 21201

University of Maryland (U. Md., Dept. Bot.)  
Dept. of Botany  
College Park, Maryland, 20740

University of Minnesota (U. Minn., Inst. Technol.)  
Institute of Technology  
Dept. of Chemical Engineering  
Minneapolis, Minnesota, 55455

University of Missouri (U. Mo., Space Sci. Res. Cent.)  
Space Sciences Research Center  
202 Jesse Hall  
Columbia, Missouri, 65201

University of North Carolina (U.N.C., Genet. Dept.)  
Genetics Dept.  
Chapel Hill, North Carolina, 27514

University of Texas (U. Tex., Southwestern Med. Sch.)  
Southwestern Medical School  
5323 Harry Heins Boulevard  
Dallas, Texas, 75235

Utah State University (Utah St. U., Plant Sci. Dept.)  
Plant Science Dept.  
Logan, Utah, 84321

Veterans Administration Hospital (V.A. Hosp.)  
Lexington, Kentucky, 40507

## ANALYSIS OF THE PUBLICATION SOURCES

Under the auspices of the Environmental Biology Program, 334 papers were published by NASA's Bioscience grantees and contractors. These papers were indexed under the various scientific pursuits listed in the table on page 63, some of which represent well recognized disciplines whereas others merely represent subject areas currently receiving notable attention. In those instances where reports might have been subsumed under more than one category, consideration was given to the scientific orientation of the author(s) or to the source of publication. Arbitrary decisions had to be made but these were not sufficient in quantity to significantly affect the data reported.

The figures on the following pages were constructed to represent, chronologically, the publication frequencies of the major subject fields. The frequency of publication for each area of study was derived by dividing the number of publications appearing in each given year by the total number for all the years considered. The publications appearing in 1960 and 1961 were combined with those of 1962 because of the small number of reports which were issued during these earlier years. The data used for the graphic illustration of 1966 included those citations listed as "in press" for that year. On the other hand, since the list of citations for 1967 was incomplete, it was omitted from the figures.

The figures derived from this study provide, to some extent, an indication of the activity and direction of research within this office. Figure 1 points out that the total publication effort has consistently risen each year although in the more recent years the increase was less pronounced. Studies on Environmental Extremes (Figure 4) have undergone the most rapid growth, from 3% in 1963 to 46% in 1966. Significant growth is also evident in the areas of Biochemistry (Figure 2), Gravity, Acceleration and Weightlessness (Figure 6) and Gaseous Environments (Figure 7). Publications on Radiobiology (Figure 3) and Bioinstrumentation and Techniques (Figure 5) have declined in recent years.

In this report, Gaseous Environments dealt with the tolerance of man and animals to various types of oxygen-mixed atmospheres and atmospheres of different pressures, whereas studies involving the effects of primitive atmospheres on the survival and growth of microorganism and plants were subsumed together with other studies under Extreme Environments.

	In Press											
	1960	1961	1962	1963	1964	1965	1966	No Date	1966	1967	No Date	TOTAL
Biochemistry			3	8	12	7	16		5	2	3	56
Radiobiology		2	4	12	17	11	4		2		2	54
Environmental Extremes			1	1	6	9	12	3	2		11	45
Bioinstrumentation and Techniques	1		3	7	13	6	2		1	1	4	38
Gravity, Acceleration and Weightlessness			1	8	4	13	8	1	2		1	38
Gaseous Environments			1	1	6	11	11		1		4	35
Photosynthesis		2		6	3	7			3			21
Physiology					4	9	2		2		4	21
Biomagnetism			3	3	3	2	1		1			13
Statistics				1		1	2		2			6
Biology			1		1		1			1	1	5
Histology					1		1					2
TOTAL	1	4	17	47	70	76	60	4	21	4	30	334

Table. Number of studies under the NASA Environmental Biology Program for the years 1960-1967 according to primary research areas.

Graphic Representation of the  
Annual Distribution of Publications  
in the Subdisciplines of Environmental Biology

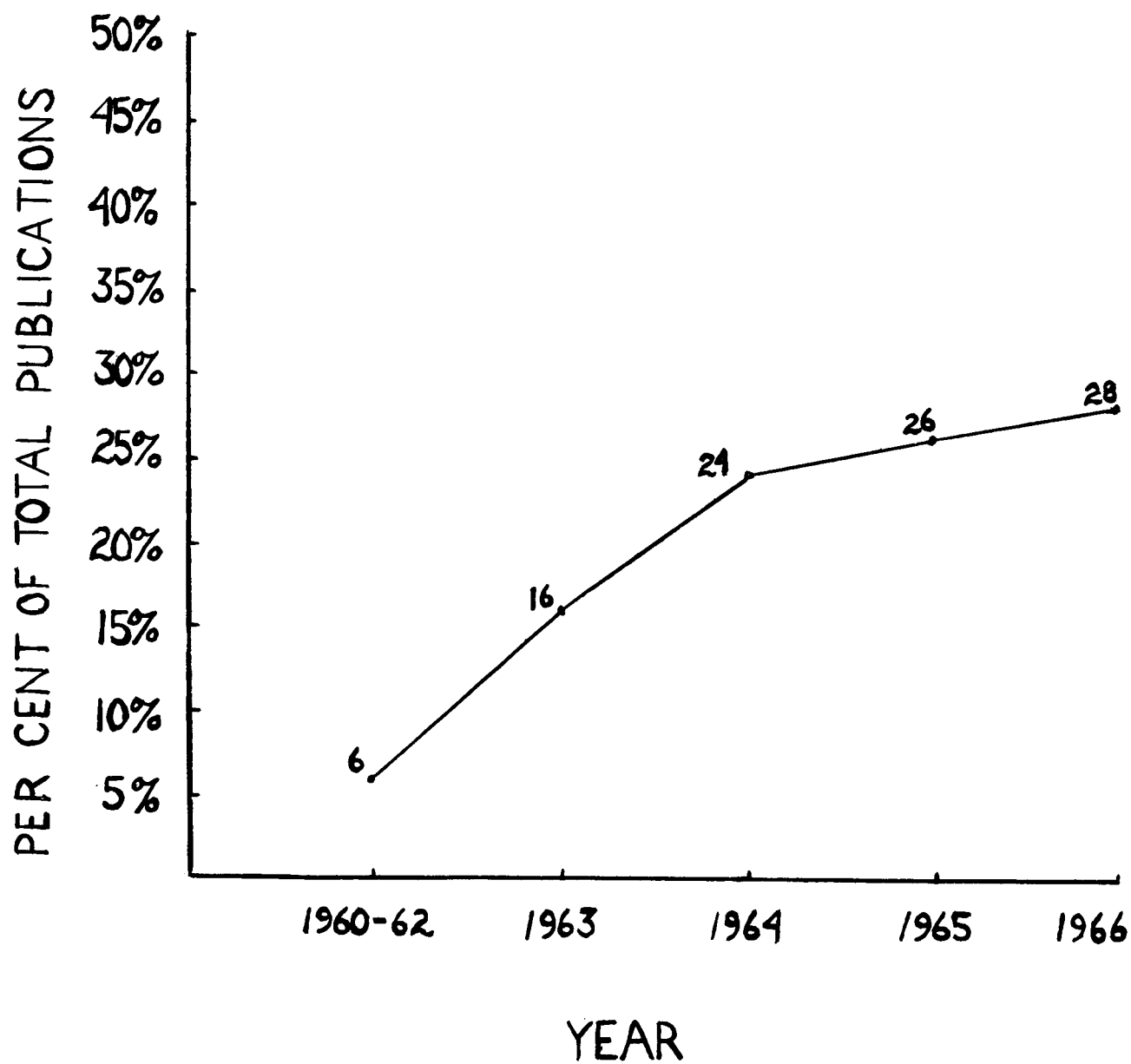


Figure 1. All Fields

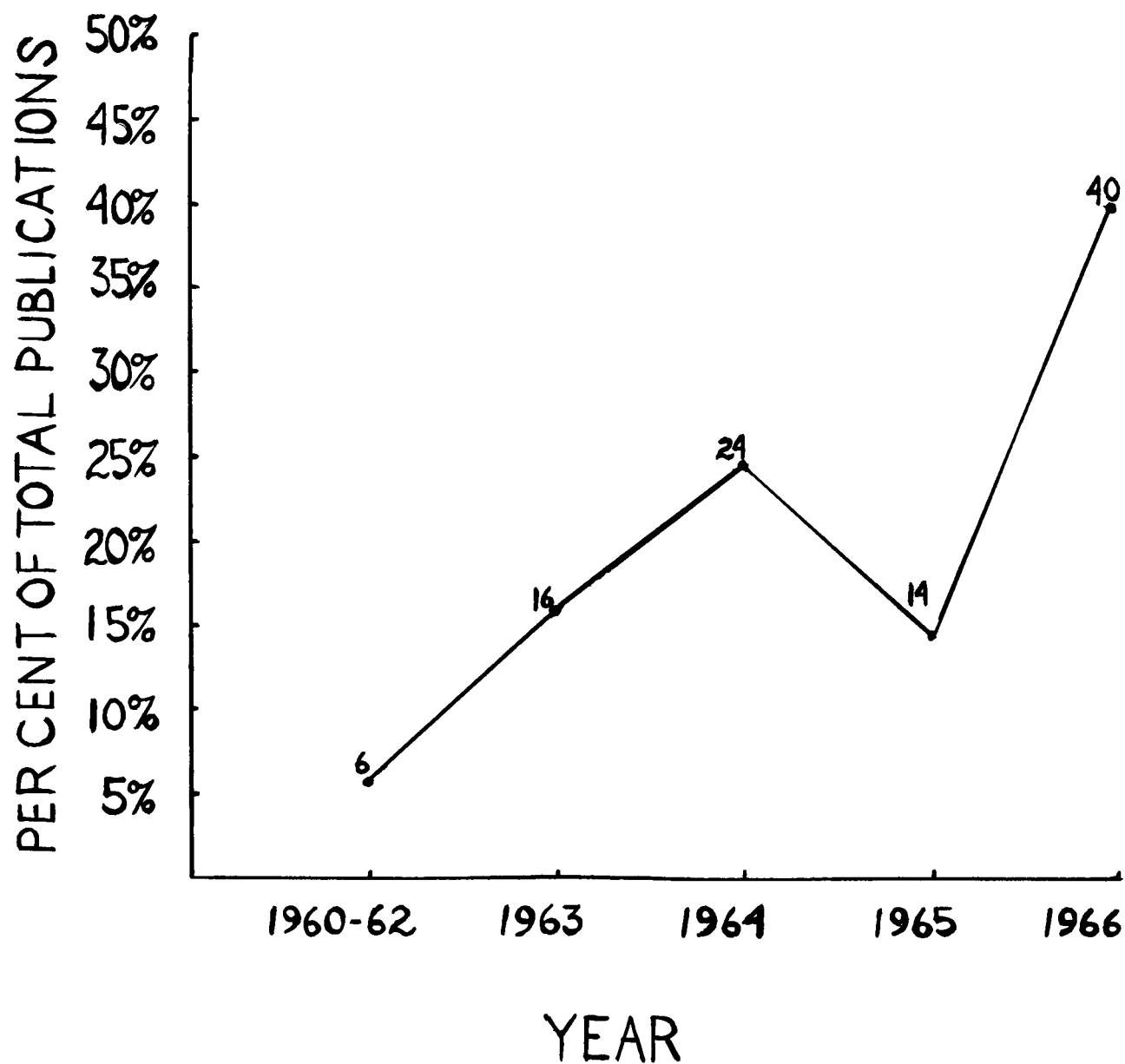


Figure 2. Biochemistry

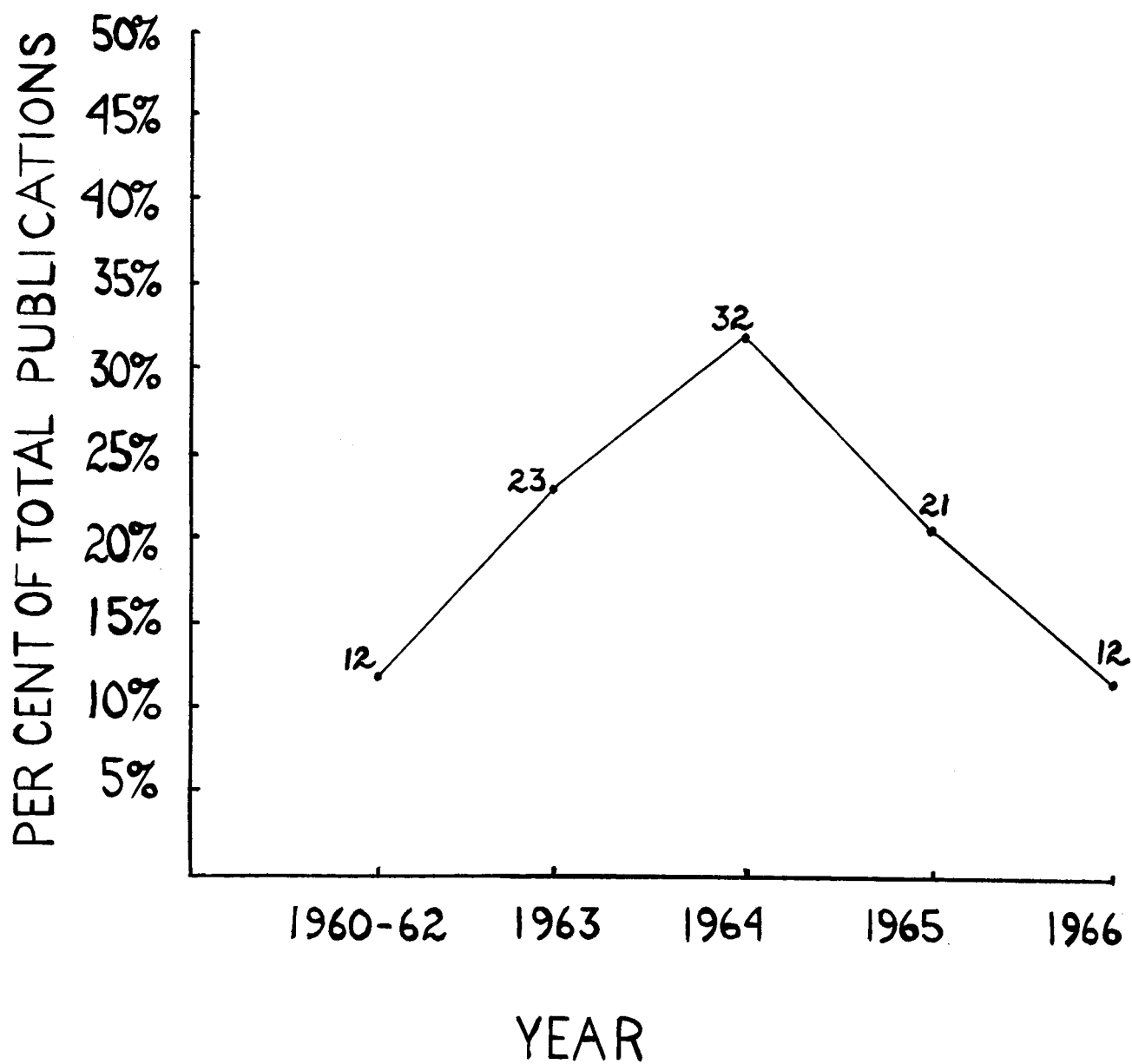


Figure 3. Radiobiology

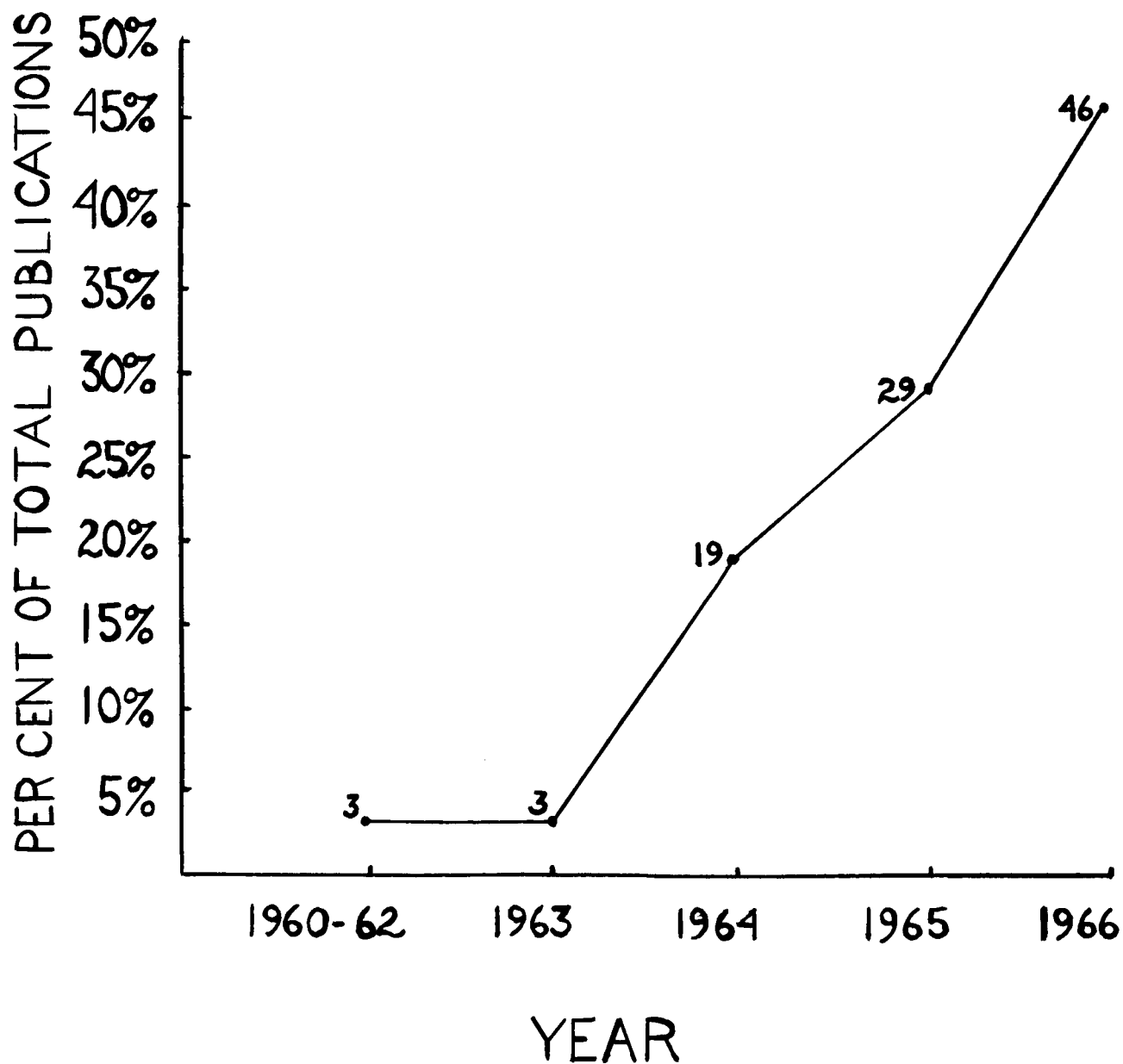


Figure 4. Environmental Extremes



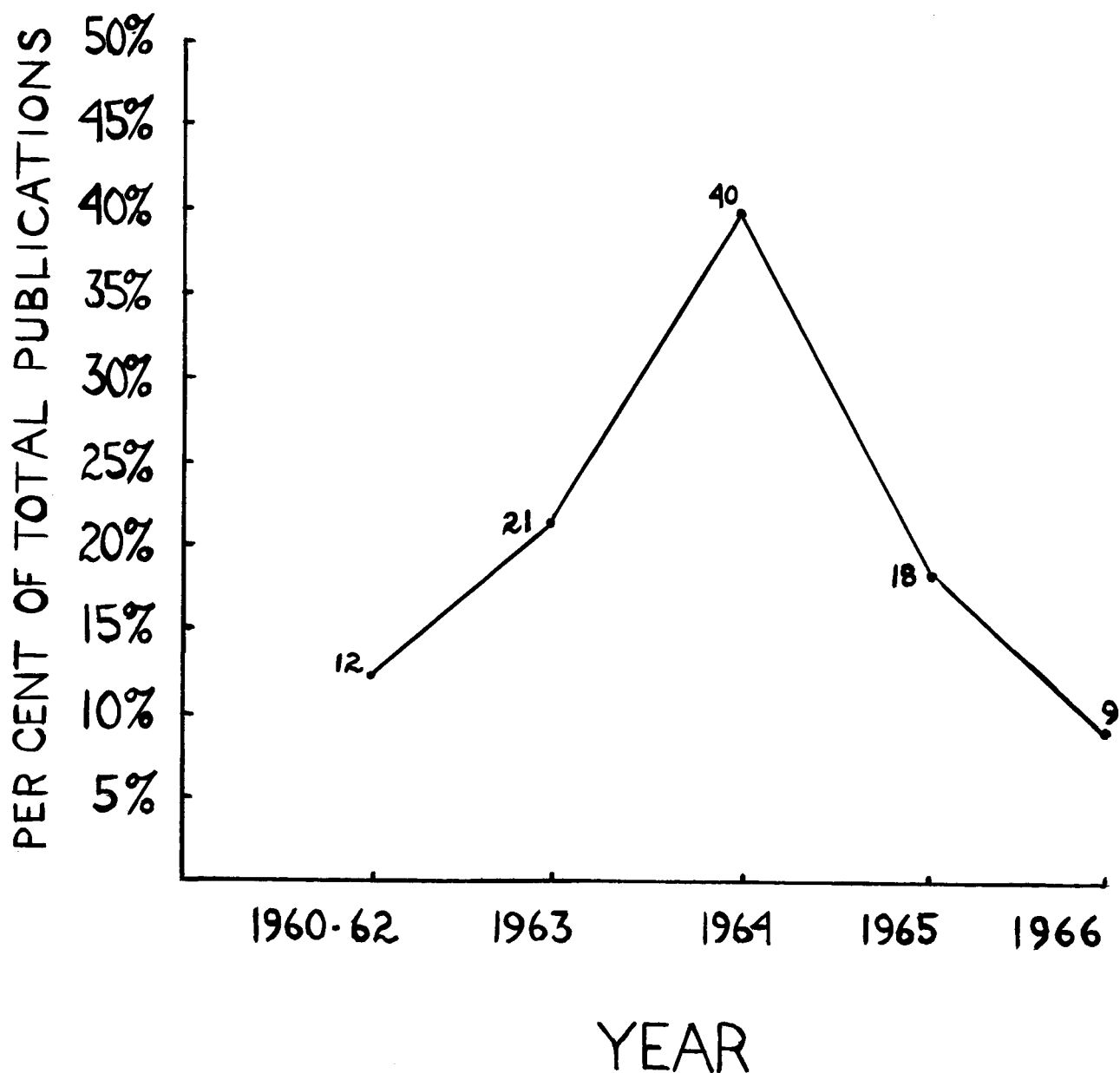


Figure 5. Bioinstrumentation and Techniques

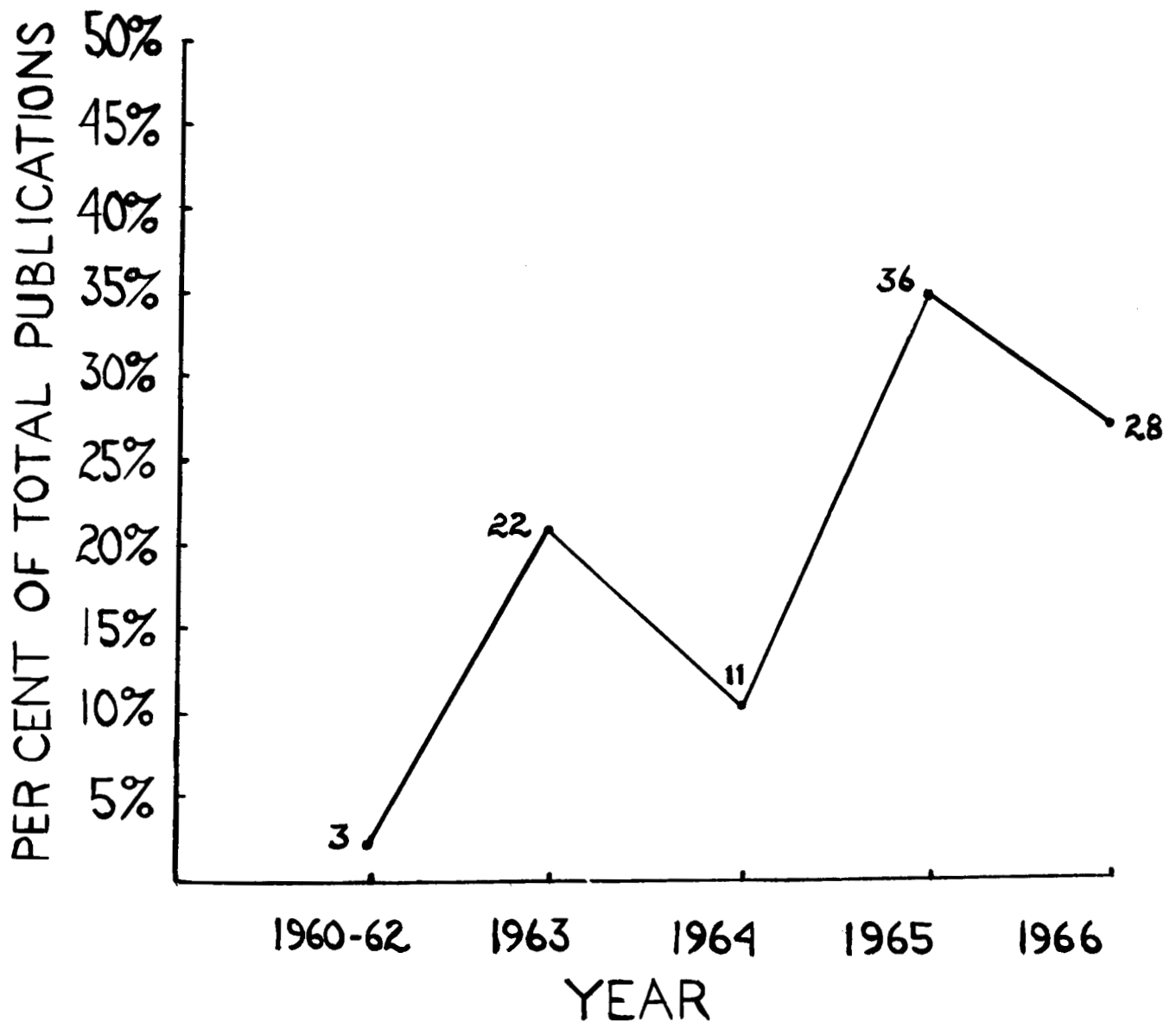


Figure 6. Gravity, Acceleration  
and Weightlessness

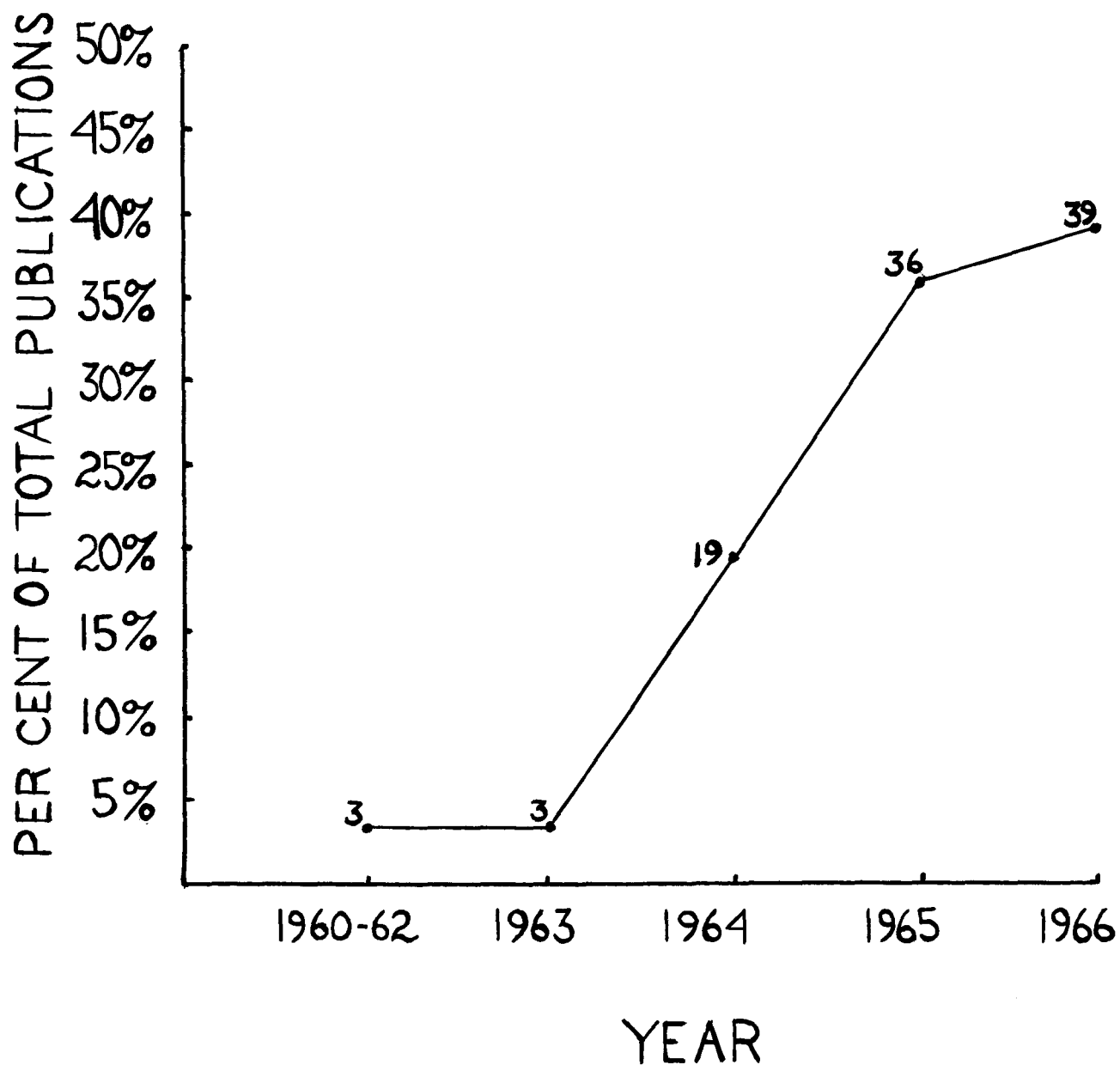


Figure 7. Gaseous Environments

## JOURNALS PUBLISHING ENVIRONMENTAL BIOLOGY ARTICLES

The following is an alphabetical list of journals in which some of the 344 articles appeared that resulted from research supported by the NASA Environmental Biology Program.

It is of particular interest to note the relatively large number of journals which have accepted one or more papers. The numbers in parentheses indicate the number of articles appearing in that journal.

Advances in the Astronautical Sciences (1)  
Advances in Chemical Engineering (1)  
Advances in Space Sciences and Technology (1)  
Aerospace Medicine (18)  
AIChE Journal (American Institute of Chemical Engineers) (1)  
American Journal of Botany (4)  
American Journal of Pathology (2)  
American Journal of Physiology (8)  
American Psychologist (1)  
ARS Journal (American Rocket Society) (1)  
Anatomical Record (2)  
Annals of the New York Academy of Sciences (3)  
Archiv fur Hydrobiologie (1)  
Archiv fur Mikrobiologie (4)  
Archives of Environmental Health (1)  
Astronautics (presently Astronautics and Aeronautics) (1)

Bacteriological Proceedings (1)  
Batelle Technical Review (1)  
Biochimica et Biophysica Acta (4)  
Biomedical Sciences Instrumentation (1)  
Biophysical Journal (1)  
Biotechnology and Bioengineering (1)  
Botanical Gazette (3)  
Bulletin of Mathematical Biophysics (1)  
The Bulletin of Pathology (1)  
Bulletin of the Torrey Botanical Club (1)

Canadian Journal of Microbiology (1)  
Canadian Journal of Physiology and Pharmacology (1)  
Canadian Journal of Zoology (1)  
Cancer Research (4)  
Comparative Biochemistry and Physiology (1)  
Cryobiology (1)

Developments in Industrial Microbiology (6)

Experientia (2)  
Experimental Cell Research (3)

Federation Proceedings (14)  
Fertility and Sterility (1)  
Folia Primatologica (1)

The Gerontologist (1)  
 Icarus (1)  
 I and E C Process Design and Development (Industrial and Engineering Chemistry) (2)  
 IRE Transactions on Medical Electronics (Institute of Radio Engineers) (presently IEEE Transactions on Biomedical Electronics) (1)  
 International Journal of Radiation Biology (and Related Studies in Physics, Chemistry and Medicine) (2)  
 Journal of the American Oil Chemists Society (1)  
 Journal of Applied Physiology (8)  
 Journal of the Arkansas Medical Society (1)  
 Journal of Bacteriology (4)  
 Journal of Cell Biology (2)  
 Journal of Cellular and Comparative Physiology (1)  
 Journal of Experimental Botany (1)  
 Journal of Fermentation Technology (1)  
 Journal of General Microbiology (1)  
 Journal of Phycology (1)  
 Journal de Physiologie (2)  
 Journal of the Royal Microscopical Society (1)  
 Journal of Surgical Research (1)  
 Journal of Theoretical Biology (2)  
 Laboratory Animal Care (1)  
 Laboratory Investigation (2)  
 Laboratory Primate Newsletter (1)  
 Life Sciences (1)  
 Memorie dell Istituto Italiano de Idrobiologia (Supplement) (1)  
 Microchemical Journal (4)  
 Nature (9)  
 Naturwissenschaft und Medizin (1)  
 Naval Research Reviews (1)  
 Physiologia Plantarum (1)  
 The Physiologist (17)  
 Plant and Cell Physiology (1)  
 Plant Physiology (18)  
 Planta (Berlin) (2)  
 Poultry Science (4)  
 Proceedings of the American Association for Cancer Research (2)  
 Proceedings of the Missouri Academy of Sciences (3)  
 Proceedings of the National Academy of Sciences (2)  
 Proceedings of the Society for Experimental Biology and Medicine (4)  
 Protoplasma (1)

Radiation Botany (1)  
Radiation Research (3)  
Record of Chemical Progress (1)

Science (7)

Texas Reports on Biology and Medicine (2)